MAHARAJA INSTITUTE OF TECHNOLOGY THANDAVAPURA

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VTU Question Papers

BE-I & II semester

Jan/Feb-2023

2022 Scheme

Maharaja Institute of Technology Thandavapura
Just of NH-766,Mysore-ooty highway,Thandavapura(Vill & Post),Nanjangud Taluk,Mysore District-571302.

INDEX

CBCS SCHEME

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First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Applied Chemistry for Civil Engineering Stream

Time: 3 hrs.   Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain the properties and application of Aluminum and its alloys.	7	L2	CO1
	b.	Explain the process of setting and hardening of cement.	7	L2	CO1
	c.	What are Refractories? Explain the classification of Refractories based on chemical composition.	6	L2	CO1
		OR			
Q.2	a.	Explain the preparation of soda-lime glass.	7	L2	CO1
	b.	Explain the testing of cement by EDTA method.	7	L2	CO1
	c.	Write a note on metal and its alloys by taking Iron as an example.	6	L2	CO1
		Module – 2			
Q.3	a.	Describe the construction and working of photovoltaic cell.	7	L2	CO2
	b.	What are Batteries? Explain construction and working of Li-ion battery.	7	L2	CO2
	c.	Explain Electrochemical corrosion of steel in concrete.	6	L2	CO2
		OR			
Q.4	a.	Explain construction and working of Methanol-oxygen Fuel cell.	7	L2	CO2
	b.	Discuss following types of corrosion: i) Stress corrosion. ii) Differential metallic corrosion.	7	L2	CO2
	c.	Describe the following corrosion control methods: i) Anodizing of Aluminum ii) Sacrificial anode method.	6	L2	CO2
		Module – 3			
Q.5	a.	Describe the estimation of total hardness by using EDTA solution.	7	L2	CO3
	b.	Define Nano materials. Explain the synthesis of Nano materials by sol-gel method.	7	L2	CO3
	c.	Mention the properties and applications of graphene.	6	L2	CO3

OR

Q.6	a.	$25cm^3$ of effluent requires $8.3cm^3$ of 0.01M acidified $K_2Cr_2O_7$ for complete oxidation. Calculate the COD of effluent sample.	7	L2	CO3
	b.	Explain the size-dependent properties of Nano materials with example i) Surface area ii) Catalytic property.	7	L2	CO3
	c.	Explain the process of water softening by Ion-exchange method.	6	L2	CO3

Module – 4

Q.7	a.	Explain the synthesis, properties and applications of Chloro Poly Vinyl Chloride (CPVC).	7	L2	CO4
	b.	Describe synthesis, properties and applications of Nylon fibers.	7	L2	CO4
	c.	Define biodegradable polymers. Explain synthesis and applications of poly lactic acid.	6	L2	CO4

OR

Q.8	a.	A polymer sample contains 100, 200, 300 and 400 molecules having molecular mass 1000, 2000, 3000 and 4000 gm/mol respectively. Calculate the Numer average and weight average molecular masses of the polymer.	7	L2	CO4
	b.	What are polymer composites? Explain properties and applications of fiber reinforced polymer composites.	7	L2	CO4
	c.	Describe synthesis and properties of Epoxy resins.	6	L2	CO4

Module – 5

Q.9	a.	Define the following terms with examples: i) Phase ii) Component iii) Degree of freedom.	6	L2	CO5
	b.	Describe the applications of conductometric sensors in estimation of acid mixture.	7	L2	CO5
	c.	Explain the determination of pH of soil sample using pH sensors.	7	L2	CO5

OR

Q.10	a.	With the help of neat phase diagram describe the Lead-Silver (pb-Ag) system.	7	L2	CO5
	b.	Write a note on phase rule and phase diagram.	6	L2	CO5
	c.	Explain the estimation of Iron using potentiometric sensors.	7	L2	CO5

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CBCS SCHEME

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First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Chemistry for EEE Stream

Time: 3 hrs.   Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
*   2. VTU Formula Hand Book is permitted.*
*   3. M : Marks , L: Bloom's level , C: Course outcomes.*

		Module – 1	M	L	C
Q.1	a.	Explain the classification of materials as conductors, insulators and semiconductors along with a suitable example with the help of band theory.	7	L2	CO1
	b.	Define the following with respect to polymers : i) Conducting polymers ii) Number average molecular weight iii) Weight average molecular weight.	6	L1	CO1
	c.	Describe eletroless plating of copper with bath composition and reaction in the manufacture of double-sided printed circuit board (PCB).	7	L2	CO1
		OR			
Q.2	a.	Discuss the production of electronic grade silicon by Czochralski(CZ) process.	6	L2	CO1
	b.	What are Polymers? In a sample of a polymer, 100 molecular have molecular mass 10^3g/mol, 200 molecular have molecular mass 10^4g/mol and 250 molecular have molecular mass 10^5g/mol. Calculate number average macular mass weight average molecular mass and polydisperisty index.	7	L3	CO1
	c.	What is grapheme? Describe the preparation and properties of graphene oxide.	7	L2	CO1
		Module – 2			
Q.3	a.	What are batteries? Explain the construction with a diagram and working of sodium-ion battery.	7	L2	CO2
	b.	What are fuel cells? Explain the construction with a diagram and working of methanol- oxygen fuel cell.	7	L2	CO2
	c.	List out a minimum three advantages and disadvantages of solar photovoltaic cells.	6	L1	CO2

		OR			
Q.4	a.	Describe the construction, and working of Vanadium redox flow battery. Mention its applications.	7	L2	CO2
	b.	Explain the construction, working and applications of Polymer Electrolyte Membrane (PEM) fuel cell.	7	L2	CO2
	c.	Discuss the construction and working of photovoltaic cell.	6	L2	CO2
		Module – 3			
Q.5	a.	What is corrosion? Explain the electrochemical theory of corrosion taking iron as an example.	7	L2	CO3
	b.	Define corrosion penetration rate (CPR). Calculate the CPR in both mpy and mmpy for steel sheet of area 150 inch^2 which experienced a weight loss of 490g after one year. Given density of steel = 7.9g/cc.	6	L3	CO3
	c.	Discuss sources, types and effects of e-waste on environment and human health.	7	L2	CO3
		OR			
Q.6	a.	Demonstrate the type of corrosion taking place in the following cases : i) A steel screw in copper sheet for a long time ii) Partially buried pipeline in soil.	6	L3	CO3
	b.	What is e-waste? Explain the methods of e-waste disposal.	7	L2	CO3
	c.	Describe the extraction of copper from e-work. Mention any two advantages of recycling.	7	L2	CO3
		Module – 4			
Q.7	a.	What are nanomaterials? Explain the following size dependent properties of nanomaterials : i) Surface area ii) Catalytic property iii) Conducting property.	7	L2	CO4
	b.	Describe the synthesis of nanomaterials by sol – gel method with a suitable example.	6	L2	CO4
	c.	What are liquid crystals? Explain the classification, properties and applications of liquid crystals in display systems.	7	L2	CO4
		OR			
Q.8	a.	Explain the properties and applications of nanofibers and nanosensors.	6	L2	CO4
	b.	Mention the properties and applications of : i) Organic Light Emitting Diode (OLED) ii) Quantum Light Emitting Diode (QLED).	7	L2	CO4
	c.	What are perovskite materials? Give the properties and applications of perovskite materials in optoelectronic devices.	7	L2	CO4

		Module – 5			
Q.9	**a.**	What is reference electrode? Describe the construction and working of calomel electrode.	7	L2	CO5
	b.	What are concentration cells? Explain the construction and working of electrolyte concentration cell with a suitable example.	6	L2	CO5
	c.	What are optical sensors? Explain the principle and instrumentation of colorimetric sensor.	7	L2	CO5
		OR			
Q.10	**a.**	What are ion-selective electrode? Discuss the construction and working of glass electrode.	7	L2	CO5
	b.	What are potentiometric sensors? Explain working principle instrumentation and applications of potentiometric sensor.	7	L2	CO5
	c.	A concentration cell is constructed by combining two lithium electrodes immersed in lithium sulphate solution of concentration 0.1m and 0.1m at 298K. Write the cell representation, cell reaction and calculate the EMF of the cell.	6	L3	CO5

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CBCS SCHEME

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BCHEM102

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Chemistry for Mechanical Engineering Stream

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	**a.**	Define calorific value. Explain principle, construction and working of bomb calorimeter to determine GCV and NCV of a solid fuel.	7	L2	CO1
	b.	Describe the construction and working of methanol-oxygen fuel cell.	6	L3	CO1
	c.	Explain the construction and working of photovoltaic cells and mention any two applications.	7	L3	CO1
		OR			
Q.2	**a.**	What are green fuels? Explain the synthesis of bio diesel by transisterification. Write any four applications.	7	L2	CO1
	b.	Describe the construction and working of Lithium-ion battery and mention any two applications.	7	L3	CO1
	c.	Define a fuel. Determine calorific value of fuels with a bomb calorimeter.	6	L2	CO1
		Module – 2			
Q.3	**a.**	What do you mean by metal finishing? Mention any five technological importance.	6	L1	CO2
	b.	What is corrosion? Explain the electrochemical theory of corrosion by taking iron as an example.	7	L2	CO2
	c.	What is CPR? Calculate the CPR in both mpy and mmpy for a thick steel sheet of area 100inch^2 which experiences a weight loss of 485g after one year. (Density of steel $= 7.9 \text{g/cm}^3$).	7	L2	CO2
		OR			
Q.4	**a.**	What is electroplating? Explain electroplating of chromium as hard and decorative coatings.	7	L2	CO2
	b.	Explain the process of Galvanization.	6	L2	CO2
	c.	Define electroless plating. Explain electroless plating of Nickel.	7	L2	CO2

Module – 3					
Q.5	**a.**	In a polymer sample, 20% of the molecules have molecular weight of 15,000g/mol, 35% of the molecules have molecular weight of 25,000g/mol and remaining molecules have molecular weight of 20,000g/mol. Calculate the number average and weight average molecular mass of the polymer.	7	L3	CO3
	b.	Explain the synthesis, properties and applications of Kevlar.	7	L3	CO3
	c.	What are lubricants? Explain any four properties and applications of lubricants.	6	L2	CO3
OR					
Q.6	**a.**	Explain the synthesis, properties and applications of PMMA.	7	L3	CO3
	b.	What are fibres? Explain any four properties and applications of polystyrene.	6	L2	CO3
	c.	Explain metal matrix composite with an example. Explain any four properties and applications of metal matrix composites.	7	L2	CO3
Module – 4					
Q.7	**a.**	Explain the principle and instrumentation of optical sensor for the estimation of copper.	6	L2	CO4
	b.	Explain the determination of pH of beverages using glass electrode.	6	L2	CO4
	c.	Define phase rule. Explain the following terms with an example phase, components and degree of freedom.	8	L3	CO4
OR					
Q.8	**a.**	Explain the estimation of FAS potentiometrically using calomel and platinum electrode as potentiometric sensors.	6	L2	CO4
	b.	Explain the procedure for the estimation of copper present in a solution using optical sensor.	6	L2	CO4
	c.	Discuss the lead-silver two component system along with phase diagram.	8	L3	CO4
Module – 5					
Q.9	**a.**	What are alloys? Explain composition, properties and applications of Alnico.	7	L2	CO5
	b.	What are perovskites? Mention any four properties and applications of perovskites.	6	L2	CO5
	c.	What are nanomaterials? Explain any three size dependent properties of nanomaterials.	7	L2	CO5
OR					
Q.10	**a.**	Explain the synthesis of nanomaterial by sol-gel method.	7	L2	CO5
	b.	Explain composition, properties and applications of stainless steel.	6	L2	CO5
	c.	Write a note on carbon nano tubes. Mention any four properties and applications of carbon nano tubes.	7	L2	CO5

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BENGK106

USN ☐☐☐☐☐☐☐☐☐☐

Question Paper Version : A

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Communicative English

Time: 1 hr.]   [Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **fifty** questions, each question carries one mark.

2. Use only **Black ball point pen** for writing / darkening the circles.

3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**

4. Darkening two circles for the same question makes the answer invalid.

5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

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1. Proposals prepared for submission to the boss
   a) Upward   b) Downward   c) Horizontal   d) Vertical

2. Counseling and training
   a) Downward   b) Upward   c) Vertical   d) Spiral

3. Oral communication is different from written communication as it is,
   a) Spoken and structured   b) Spoken and transitory
   c) Spoken and Permanent   d) Spoken and time consuming

4. Who Encodes the message?
   a) Sender   b) Receiver   c) Transmitting media   d) Both (a) and (b)

5. Which one of the following is not a feature of grapevine communication?
   a) Rapid   b) Formal   c) Multidirectional   d) Cluster

6. Which of the following is oral communication?
   a) Dictation   b) Brochure   c) Notice   d) Letter

7. In communication the observation of a receiver's response is called,
   a) Feedback   b) Survey   c) Channel   d) Message

8. Badly encoded message leaves its receiver confused and not well informed.
   a) True   b) False   c) Both (a) and (b)   d) None of these

9. Among the following elements, which element is the medium through which message is sent.

   a) Sender   b) Channel   c) Context   d) Noise

10. This type of communication takes place within an individual : _____

   a) Extrapersonal   b) Intrapersonal   c) Organizational   d) Interpersonal

11. Transcription of the word "Tomb" is _____

   a) /tum/   b) /tu:m/   c) tum:/   d) None of these

12. There are _____ sounds in English.

   a) 44   b) 12   c) 24   d) 8

13. Silent letter in "Castle".

   a) e   b) t   c) a   d) ℓ

14. Division of the syllable "information" is _____

   a) infor-ma-tion   b) in-for-mation   c) in-for-ma-tion   d) info-rmat-ion

15. How many consonants are there in English?

   a) 4   b) 12   c) 24   d) 44

16. How many Vowels are there in English?

   a) 44   b) 12   c) 24   d) 20

17. Division of the syllable of "window" is _____

   a) Win-dow   b) Wi-ndow   c) Wi-n-dow   d) Wind-ow

18. Silent letter in the word "Knee" is _____

   a) k   b) n   c) e   d) None of these

19. Communication is the _____ of business.

   a) back bone   b) blood   c) nerve   d) hand

20. Identify the word with one syllable in the following :

   a) grass   b) fulfil   c) folder   d) conquer

Identify the Parts of speech of the underlined words :

21. Steve Waugh was an inspirational captain.

   a) verb   b) proper noun   c) noun   d) adverb

22. Abstract noun form of starve is _____

   a) Starvation   b) Starve   c) Starving   d) None of these

23. Wow! We won the match!

   a) Adjective   b) Interjection   c) Noun   d) Verb

24. Gandhiji is known for his non-violence.

   a) Noun   b) Pronoun   c) Verb   d) Abstract-Noun

25. In general hot country like India, it is only winters that one can experience the Soothing comfort.

   a) Verb   b) Noun   c) Adjective   d) Adverb

Choose the word that can fill the gap appropriately :

26. Man is a _____ of circumstances.
a) Master   b) Companion   c) Creature   d) Slave

27. I have been ill_____ last Monday.
a) since   b) from   c) for   d) by

28. A lady's purse _____
a) Parasol   b) Pantomine   c) Reticule   d) Vertibule

One word substitution :

29. Saying things in a roundabout way.
a) Circumlocution   b) Straight away   c) Around about   d) None of these

30. Someone who compiles a dictionary.
a) Calligrapher   b) Teetotaller   c) both   d) Lexicographer

Question Tags :

31. They are 'reaching by Tomorrow', _____
a) aren't they   b) are they   c) both   d) none of these

32. You 'told me this 'earlier', _____
a) Didn't you?   b) Did you?   c) Did they?   d) Do they?

33. The synonym of "Benefit" is _____
a) yield   b) benefit   c) loss   d) none of these

34. The antonyms of "Crazy" is _____
a) Sane   b) Insane   c) Unrealistic   d) (a) & (b)

35. Please give me a peace / piece of advice.
a) peace   b) piece   c) Both (a) & (b)   d) None of these

36. The closest meaning of the word <u>Slender</u> is,
a) Slim   b) Sconty   c) Weak   d) Poor

37. The day of Judgement _____
a) Doomsday   b) Verdict   c) Both (a) & (b)   d) None of these

38. She _____ the report indignantly.
a) Cast away   b) Cast aside   c) Cast off   d) Cast a way

39. The sick child _____ while waiting at the doctor's.
a) Threw off   b) Threw up   c) Threw out   d) Threw down

40. The suffix of the word "worth" is,
a) worth   b) worthless   c) worthy   d) none of these

41. "Types of Cancer" can be presented by _____ method.
a) Topical pattern   b) Spatial pattern
c) Psychological pattern   d) None of these

42. The weak form of the is,

a) ಕ೯   b) ಕ   c) ಕಃ   d) None of these

43. The syllable of the word "Fauna" is,

a) CV-CV   b) CVVCV   c) CVC   d) None of these

44. Words ending in $|dz|$ _____

a) judge   b) then   c) their   d) below

45. Example for initial minimal pair is _____

a) Try-Dry   b) Set-Sat   c) Pull-Pool   d) Cab-Cap

46. RP is known as _____

a) Revised Pronunciation   b) Received Pronunciation

c) Both (a) & (b)   d) None of these

47. Which of these should be avoided for an effective speech?

a) Confidence   b) Clarity   c) Pauses   d) Rudeness

48. Which of these should be avoided during delivery of speech?

a) Planning of speech   b) Long Pauses

c) Organization   d) Long sentences

49. The acronym of 'QA' is _____

a) Question & Answer   b) Quality Assurance

c) Quality Assist   d) None of these

50. The simple present of this below sentence - The fruit is smelling sweet,

a) The fruit smells sweet   b) The fruit is sweet

c) Both (a) & (b)   d) None of these

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BENGK106

USN ☐☐☐☐☐☐☐☐☐☐

Question Paper Version : B

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Communicative English

Time: 1 hr.] [Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **fifty** questions, each question carries one mark.

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a) Calligrapher   b) Teetotaller   c) both   d) Lexicographer

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a) aren't they   b) are they   c) both   d) none of these

40. You 'told me this 'earlier', _____
a) Didn't you?   b) Did you?   c) Did they?   d) Do they?

41. Transcription of the word "Tomb" is _____
    a) /tum/   b) /tu:m/   c) tum:/   d) None of these

42. There are _____ sounds in English.
    a) 44   b) 12   c) 24   d) 8

43. Silent letter in "Castle".
    a) e   b) t   c) a   d) ℓ

44. Division of the syllable "information" is _____
    a) infor-ma-tion b) in-for-mation   c) in-for-ma-tion d) info-rmat-ion

45. How many consonants are there in English?
    a) 4   b) 12   c) 24   d) 44

46. How many Vowels are there in English?
    a) 44   b) 12   c) 24   d) 20

47. Division of the syllable of "window" is _____
    a) Win-dow   b) Wi-ndow   c) Wi-n-dow   d) Wind-ow

48. Silent letter in the word "Knee" is _____
    a) k   b) n   c) e   d) None of these

49. Communication is the _____ of business.
    a) back bone   b) blood   c) nerve   d) hand

50. Identify the word with one syllable in the following :
    a) grass   b) fulfil   c) folder   d) conquer

* * * * *

CBCS SCHEME

USN [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Communicative English

Time: 1 hr.]   [Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **fifty** questions, each question carries one mark.

2. Use only **Black ball point pen** for writing / darkening the circles.

3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**

4. Darkening two circles for the same question makes the answer invalid.

5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

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1. The synonym of "Benefit" is _____
    a) yield   b) benefit   c) loss   d) none of these

2. The antonyms of "Crazy" is _____
    a) Sane   b) Insane   c) Unrealistic   d) (a) & (b)

3. Please give me a peace / piece of advice.
    a) peace   b) piece   c) Both (a) & (b)   d) None of these

4. The closest meaning of the word Slender is,
    a) Slim   b) Sconty   c) Weak   d) Poor

5. The day of Judgement _____
    a) Doomsday   b) Verdict   c) Both (a) & (b)   d) None of these

6. She _____ the report indignantly.
    a) Cast away   b) Cast aside   c) Cast off   d) Cast a way

7. The sick child _____ while waiting at the doctor's.
    a) Threw off   b) Threw up   c) Threw out   d) Threw down

8. The suffix of the word "worth" is,
    a) worth   b) worthless   c) worthy   d) none of these

    Question Tags :
9. They are 'reaching by Tomorrow', _____
    a) aren't they   b) are they   c) both   d) none of these

10. You 'told me this 'earlier', _____
    a) Didn't you?   b) Did you?   c) Did they?   d) Do they?

11. Transcription of the word "Tomb" is _____
   a) /tum/   b) /tu:m/   c) tum:/   d) None of these

12. There are _____ sounds in English.
   a) 44   b) 12   c) 24   d) 8

13. Silent letter in "Castle".
   a) e   b) t   c) a   d) ℓ

14. Division of the syllable "information" is _____
   a) infor-ma-tion   b) in-for-mation   c) in-for-ma-tion   d) info-rmat-ion

15. How many consonants are there in English?
   a) 4   b) 12   c) 24   d) 44

16. How many Vowels are there in English?
   a) 44   b) 12   c) 24   d) 20

17. Division of the syllable of "window" is _____
   a) Win-dow   b) Wi-ndow   c) Wi-n-dow   d) Wind-ow

18. Silent letter in the word "Knee" is _____
   a) k   b) n   c) e   d) None of these

19. Communication is the _____ of business.
   a) back bone   b) blood   c) nerve   d) hand

20. Identify the word with one syllable in the following :
   a) grass   b) fulfil   c) folder   d) conquer

Identify the Parts of speech of the underlined words :
21. Steve Waugh was an inspirational captain.
   a) verb   b) proper noun   c) noun   d) adverb

22. Abstract noun form of starve is _____
   a) Starvation   b) Starve   c) Starving   d) None of these

23. Wow! We won the match!
   a) Adjective   b) Interjection   c) Noun   d) Verb

24. Gandhiji is known for his non-violence.
   a) Noun   b) Pronoun   c) Verb   d) Abstract-Noun

25. In general hot country like India, it is only winters that one can experience the Soothing comfort.
   a) Verb   b) Noun   c) Adjective   d) Adverb

26. Proposals prepared for submission to the boss
   a) Upward   b) Downward   c) Horizontal   d) Vertical

27. Counseling and training
   a) Downward   b) Upward   c) Vertical   d) Spiral

28. Oral communication is different from written communication as it is,
a) Spoken and structured
b) Spoken and transitory
c) Spoken and Permanent
d) Spoken and time consuming

29. Who Encodes the message?
a) Sender
b) Receiver
c) Transmitting media
d) Both (a) and (b)

30. Which one of the following is not a feature of grapevine communication?
a) Rapid
b) Formal
c) Multidirectional
d) Cluster

31. Which of the following is oral communication?
a) Dictation
b) Brochure
c) Notice
d) Letter

32. In communication the observation of a receiver's response is called,
a) Feedback
b) Survey
c) Channel
d) Message

33. Badly encoded message leaves its receiver confused and not well informed.
a) True
b) False
c) Both (a) and (b)
d) None of these

34. Among the following elements, which element is the medium through which message is sent.
a) Sender
b) Channel
c) Context
d) Noise

35. This type of communication takes place within an individual : _____
a) Extrapersonal
b) Intrapersonal
c) Organizational
d) Interpersonal

36. "Types of Cancer" can be presented by _____ method.
a) Topical pattern
b) Spatial pattern
c) Psychological pattern
d) None of these

37. The weak form of the is,
a) ðə
b) ð
c) ðiː
d) None of these

38. The syllable of the word "Fauna" is,
a) CV-CV
b) CVVCV
c) CVC
d) None of these

39. Words ending in |dz| _____
a) judge
b) then
c) their
d) below

40. Example for initial minimal pair is _____
a) Try-Dry
b) Set-Sat
c) Pull-Pool
d) Cab-Cap

41. RP is known as _____
a) Revised Pronunciation
b) Received Pronunciation
c) Both (a) & (b)
d) None of these

42. Which of these should be avoided for an effective speech?
a) Confidence
b) Clarity
c) Pauses
d) Rudeness

43. Which of these should be avoided during delivery of speech?
a) Planning of speech
b) Long Pauses
c) Organization
d) Long sentences

44. The acronym of 'QA' is _____
a) Question & Answer
b) Quality Assurance
c) Quality Assist
d) None of these

45. The simple present of this below sentence - The fruit is smelling sweet,
a) The fruit smells sweet
b) The fruit is sweet
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d) None of these

One word substitution :

46. Saying things in a roundabout way.
a) Circumlocution
b) Straight away
c) Around about
d) None of these

47. Someone who compiles a dictionary.
a) Calligrapher
b) Teetotaller
c) both
d) Lexicographer

Choose the word that can fill the gap appropriately :

48. Man is a _____ of circumstances.
a) Master
b) Companion
c) Creature
d) Slave

49. I have been ill_____ last Monday.
a) since
b) from
c) for
d) by

50. A lady's purse _____
a) Parasol
b) Pantomine
c) Reticule
d) Vertibule

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| Question Paper Version : D |

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Communicative English

Time: 1 hr.]   [Max. Marks: 50

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* * * * *

Version D – 4 of 4
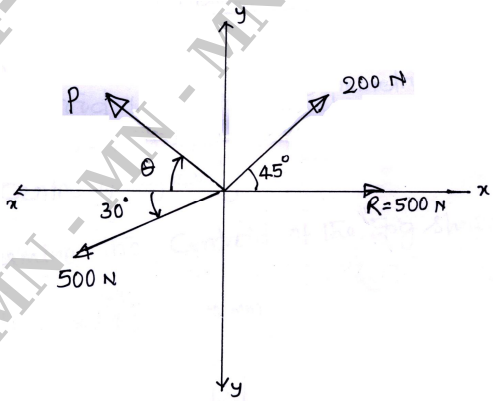
CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐

BESCK104A/BESCKA104

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Introduction to Civil Engineering

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain briefly civil engineering disciplines.	10	L1	CO1
	b.	List the qualities of good building stone.	10	L1	CO1
		OR			
Q.2	a.	Explain the following: (i) Reinforced Cement Concrete (RCC) (ii) Pre-Stressed Concrete (PSC) (iii) Construction Chemicals	10	L1	CO1
	b.	Explain different types of foundations, briefly.	10	L1	CO1
		Module – 2			
Q.3	a.	Explain concept of (i) Smart city (ii) Clean city	10	L1	CO2
	b.	Explain management of (i) Urban air pollution (ii) Solid waste	10	L1	CO2
		OR			
Q.4	a.	Explain: (i) Energy Efficient Buildings (ii) Temperature Control in Buildings	10	L1	CO2
	b.	Explain: (i) Security System (ii) Smart Buildings	10	L1	CO2
		Module – 3			
Q.5	a.	Explain classification of force system with neat sketches.	10	L1	CO3
	b.	Determine magnitude and direction of "P" for the system shown in Fig.Q5(b). Four coplanar forces acting at a point. One of the forces is unknown. The resultant has a magnitude of 500 N and is acting along x-axis.	10	L3	CO3

Fig.Q5(b)

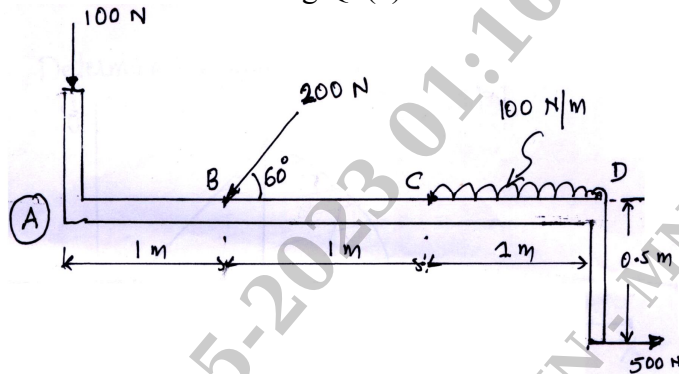|					
		OR			
Q.6	**a.**	State and prove Varignon's theorem of moments.	**10**	**L3**	**CO3**
	b.	Find the magnitude, direction and position of the resultant force with respect to point 'A' as shown in Fig.Q6(b). Fig.Q6(b)	**10**	**L3**	**CO3**
		Module – 4			
Q.7	**a.**	Explain the following terms: (i) Centroid (ii) Axis of symmetry (iii) Axis of reference (iv) Centroidial axis (v) Centre of gravity	**10**	**L1**	**CO4**
	b.	Determine the centroid of the Fig.Q7(b) shown below: Fig.Q7(b)	**10**	**L1**	**CO4**
		OR			
Q.8	**a.**	Prove that for a semicircle $\overline{Y} = \dfrac{4R}{3\pi}$.	**10**	**L1**	**CO4**
	b.	Determine the centroid of area shown in Fig.Q8(b). Fig.Q8(b)	**10**	**L1**	**CO4**
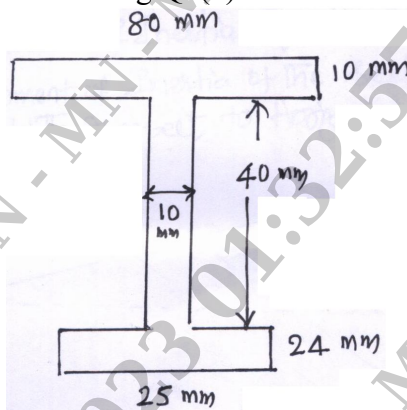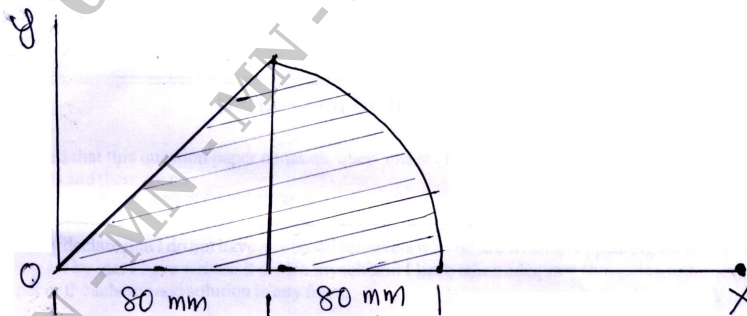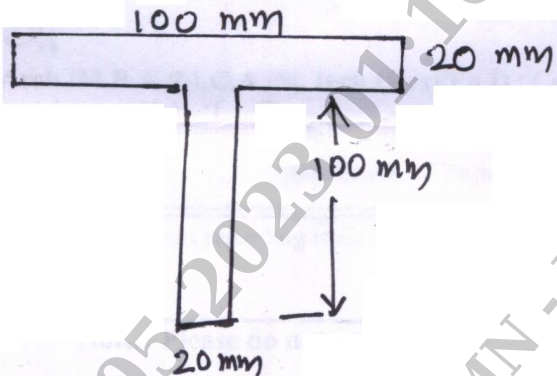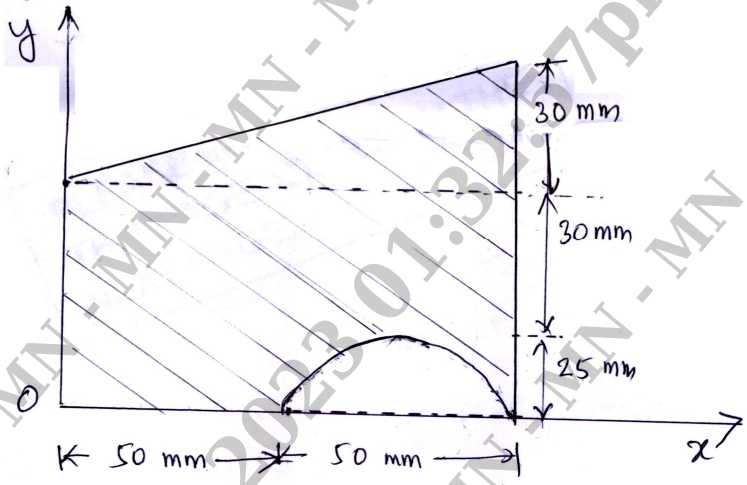
		Module – 5			
Q.9	**a.**	State and prove parallel axis theorem.	**10**	**L1**	**CO5**
	b.	Determine moment of inertia about horizontal centroidal axis for the Fig.Q9(b). Fig.Q9(b)	**10**	**L2**	**CO5**
		OR			
Q.10	**a.**	Derive the moment of inertia equation for a rectangle.	**10**	**L1**	**CO5**
	b.	Determine the moment of inertia of the section shown in Fig.Q10(b) with respect to horizontal to horizontal centroidal axis (Ixx). Fig.Q10(b)	**10**	**L2**	**CO5**

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First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Introduction to Electrical Engineering

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

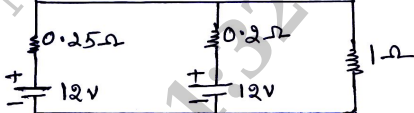|		Module – 1	M	L	C
Q.1	a.	With the help of single line diagram, explain the electrical power transmission and distribution system.	6	L2	CO2
	b.	Explain the working of hydro power generation using relevant block diagram.	8	L2	CO1
	c.	A resistance R is connected in series with a parallel circuit comprising of two resistance 12Ω and 8Ω. The total power in the circuit is 70W, when the applied voltage is 20V. Calculate R.	6	L3	CO1
		OR			
Q.2	a.	State Kirchhoff's law for DC circuits. Illustrate with an example.	6	L2	CO1
	b.	With the help of block diagram, explain the working of Solar power generation.	8	L2	CO1
	c.	For the circuit shown in Fig. Q2(c), find the current supplied by each battery and power dissipated in 1Ω resistor. Fig. Q2(c)	6	L3	CO2
		Module – 2			
Q.3	a.	A pure inductor excited by sinusoidal varying AC voltage, show that the average power consumed by inductor is zero.	8	L2	CO1
	b.	Define i) Real power ii) Reactive power iii) Apparent power iv) Power factor.	6	L1	CO1
	c.	The current in a circuit is $(8 – j10)$A, when the applied voltage is $(50 + j25)$ volts. Determine i) The magnitude of the current ii) Impedance iii) The circuit elements iv) Power factor v) Power.	6	L3	CO2
		OR			
Q.4	a.	Develop an equation for the power consumed by a R – C series circuit. Draw the waveform of voltage, current and power.	8	L2	CO3
	b.	With relevant diagrams, explain the concept of line values of voltage and current and phase values of voltage and currents in 3 φ star and delta connections.	6	L2	CO3

	c.	A circuit having a resistance of 12Ω on inductors of 0.15H and a capacitance of 100µF in series is connected across a 100V, 50Hz supply. Calculate i) Impedance ii) Current iii) Power factor iv) Phase difference between the current and supply voltage v) Power.	6	L3	CO3

Module – 3

Q.5	a.	With the help of neat diagram, explain the construction of DC generator.	8	L2	CO4
	b.	With usual notations, derive the torque equation of a DC motor.	6	L2	CO4
	c.	A d.c. shunt generator has a shunt field winding resistance of 100Ω, it is supplying a load of 5kW at a voltage of 250V. If its armature resistance is 0.22Ω and per brush voltage drop is 1 volt. Calculate the induced e.m.f of generator.	6	L3	CO4

OR

Q.6	a.	Give the classification of DC generator. Obtain the expression for EMF equation of a DC generator.	8	L2	CO4
	b.	With neat diagrams, explain the speed control of DC shunt motor.	6	L2	CO4
	c.	A 4 pole dc shunt motor takes 22 A from 220V supply. the armature and field resistances are respectively 0.5Ω and 100Ω. The armature is lap connected with 300 conductors. If the flux per pole is 20 mwb, calculate i) Speed ii) Gross torque.	6	L3	CO4

Module – 4

Q.7	a.	Explain the working principle of single phase transformer and its necessity in power system.	8	L1	CO1
	b.	Explain the concept of rotating magnetic field in a 3 – phase induction motor with neat vector diagrams.	6	L2	CO2
	c.	The maximum efficiency at full load and unity power factor of a single – phase 25KVA, 500V/1000V, 50Hz, transformer is 98%. Determine its efficiency at i) 75% load, 0.9 p.f. ii) 50% load, 0.8 p.f.	6	L3	CO2

OR

Q.8	a.	With relevant diagrams, explain the construction of 3 – phase induction motors.	8	L2	CO2
	b.	Derive an EMF equation of single phase transformer with usual notation.	6	L2	CO2
	c.	A 3 – phase, 50Hz, 4 pole induction motor, its rotor induced e.m.f is 1.5 Hz frequency. Calculate i) Synchronous speed ii) Full load slip iii) Actual speed.	6	L3	CO3

Module – 5

Q.9	a.	List the types of wiring system used for domestic / industry. Explain suitable wiring used for staircase, give the schematic / circuit diagram.	6	L1	CO5
	b.	What is Earthing? With a neat diagram, explain plate earthing.	8	L2	CO5
	c.	Define Unit and Tariff. Explain the two port tariff with its merits and demerits.	6	L2	CO5

		OR			
Q.10	a.	What is Fuse? With neat diagram, explain the working principle of fuse.	6	L2	CO5
	b.	Define Electric shock. What are the safety precaution to be taken against to avoid electric shock?	8	L2	CO5
	c.	An electric boiler draws 6A current at 230V for 4 hrs. The electricity costs Rs 3/- per unit. Determine the total cost.	6	L3	CO5

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CBCS SCHEME

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BESCK104D/BESCKD104

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Introduction to Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	**M**	**L**	**C**
Q.1	**a.**	Difference between renewable and non-renewable energy sources.	6	L2	CO1
	b.	Briefly explain the role of Mechanical Engineering in Industries and Society.	6	L2	CO1
	c.	Illustrate the operation of liquid flat plate collector and solar-photo-voltaic cells with neat sketch.	8	L2	CO1
		OR			
Q.2	**a.**	Briefly describe the Emerging Trends and Technologies in any two sectors.	6	L2	CO1
	b.	With neat sketch, explain the working of Hydel Power Plant.	6	L2	CO1
	c.	Illustrate the operation of Wind Mill with neat sketch.	8	L2	CO1
		Module – 2			
Q.3	**a.**	Define lathe. With neat sketch and explain the following machining operations. i) Turning ii) Facing iii) Knurling iv) Boring	10	L2	CO2
	b.	Define CNC. With block diagram, explain the different components used in CNC.	10	L2	CO2
		OR			
Q.4	**a.**	Define milling machine. With neat sketch, explain the following machining operations: i) Drilling ii) Reaming iii) Plane-Milling iv) Slot Milling	10	L2	CO2
	b.	Write the advantages and applications of CNC.	6	L2	CO2
	c.	Define 3-D printing and classify.	4	L2	CO2
		Module – 3			
Q.5	**a.**	With neat sketch and explain the working of 4-stroke petrol engine. And also write its P-V diagram.	10	L2	CO3
	b.	Define EV (Electric Vehicle). With block diagram, explain the different components used in EV. Also write benefits of EV in current trend.	10	L2	CO3

		OR			
Q.6	a.	With neat sketch and explain the working of 4-stroke diesel engine. And also write its P-V diagram.	10	L2	CO3
	b.	Define HEV (Hybrid Electric Vehicle). With block diagram, explain the different components used in HEV. Also write limitations of EV's in current trend.	10	L2	CO3
		Module – 4			
Q.7	a.	Define Engineering Material. Briefly explain the classifications of ferrous and non-ferrous metals.	10	L2	CO4
	b.	Define welding. With neat sketch, explain the working of Electric Arc Welding.	10	L2	CO4
		OR			
Q.8	a.	Define the following terms: i) Ceramic ii) Graphite iii) Polymers iv) Shape Memory Alloy	10	L1	CO4
	b.	Define Soldering. With neat sketch, explain the working of Gas welding and name the different types of flames used in oxy-acetylene welding.	10	L2	CO4
		Module – 5			
Q.9	a.	With a neat sketch, explain the open-loop and closed-loop mechatronic systems.	10	L2	CO5
	b.	Define Automation. Explain the classifications of automation.	10	L2	CO5
		OR			
Q.10	a.	Define Industrial Robot. Explain the different configurations of Robot with neat sketch.	10	L2	CO5
	b.	Define IOT. Briefly explain the characteristics of IOT.	6	L2	CO5
	c.	Explain the logical design of IOT.	4	L2	CO5

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CBCS SCHEME

USN | | | | | | | | | | |

BETCK105F/BETCKF105

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Waste Management

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Define solid wastes. Explain the source based classification of solid wastes.	10	L1	CO1
	b.	Explain the various functional elements of solid waste management system.	10	L1	CO1
		OR			
Q.2	a.	List out the various factors affecting solid waste management system. Explain any two in detail.	10	L6	CO1
	b.	Write short notes on Indian scenario of management of solid waste.	10	L6	CO1
		Module – 2			
Q.3	a.	Enumerate the various field investigations involved in waste stream assessment.	10	L2	CO1
	b.	What are the various factors which affect the quantity and composition of solid wastes? Explain.	10	L1	CO2
		OR			
Q.4	a.	Explain the physical characteristics of solid wastes.	10	L1	CO2
	b.	Describe the environmental effects of inadequate and improper waste management.	10	L1	CO2
		Module – 3			
Q.5	a.	Explain the various collection components that influences the waste collection systems.	10	L1	CO2
	b.	What is a Transfer station? Explain its types based on its size.	10	L2	CO3
		OR			
Q.6	a.	Describe the various options of disposal of solid wastes.	10	L3	CO3
	b.	Explain the various stages involved in sanitary land filling.	10	L1	CO3
		Module – 4			
Q.7	a.	Explain volume reduction or compaction of solid wastes and its types.	10	L1	CO3
	b.	Enumerate any three methods of component separation technique.	10	L3	CO3
		OR			
Q.8	a.	What is source Reduction? How do we monitor waste Reduction?	10	L1	CO3
	b.	Describe the different elements of Recycling programme.	10	L3	CO3
		Module – 5			
Q.9	a.	Explain the various characteristics of Hazardous wastes.	10	L1	CO4
	b.	Describe the five general categories of Hazardous wastes.	10	L3	CO4
		OR			
Q.10	a.	List out the various physical and chemical treatment of hazardous wastes. Explain any two.	10	L6	CO4
	b.	Write short notes on pollution prevention and waste minimization.	10	L1	CO4

* * * * *

USN ☐☐☐☐☐☐☐☐☐☐

Question Paper Version : A

First Semester B.E./B. Tech Degree Examination, Jan./Feb. 2023
Indian Constitution

Time: 1 hrs.   Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **fifty** questions, each question carries one mark.

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1. The Indian Constitution is
   a) Based on Conventions
   b) A brief document
   c) An evolved constitution
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2. The Constituent Assembly adopted the Indian Constitution on
   a) August 15, 1947   b) November 26, 1949   c) January 26, 1950   d) January 26, 1948

3. The Constitution of India declares India as
   a) A Unitary State
   b) A Federation
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4. The Constitution of India is
   a) Levitary in form but federal in spirit
   b) Levitary with strong federal bias
   c) Is full of strong levitary features
   d) Federal in form , but levitary in spirit

5. Chairman of the Drafting Committee was
   a) Dr. B. R. Ambedkar
   b) Dr. Rajendra Prasad
   c) Jagajeevan Ram
   d) Jawaharlal Nehru

6. What is the present number of Articles in Indian Constitution?
   a) 395   b) 376   c) 445   d) 448

7. Which Amended Act added the word "Secular" in Constitution of India?
   a) 42nd Amendment   b) 44th Amendment   c) 45th Amendment   d) 46th Amendment

8. The Government of India Act 1935 provided for
   a) Diarchy at the center
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    c) Right to Constitutional Remedies   d) Right to get equal pay for equal work

13. Which of the following Articles of the Constitution of India covers the Right to Freedom?
    a) Articles 19 to 22   b) Articles 29 to 30   c) Article 32   d) Articles 14 to 18

14. During National emergency which of following provision stands suspended.
    a) DPSP   b) Amendment procedures
    c) Fundamental Rights   d) Judicial Review

15. Which Fundamental Right ceased to be a Fundamental Right and became a Legal Right under the 44th Amendment of the Indian Constitution.
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16. Fundamental Rights in the Indian Constitution have been taken from the
    a) Russian Constitution   b) US Constitution
    c) British Constitution   d) Act of 1935

17. Who among the following headed the nine Judge Constitutional bench that declared the Right to Privacy as a Fundamental Right?
    a) J.S Khehar   b) Dipak Misra   c) H.J Karia   d) T.S Jhakar

18. Article 21A of the Constitution of India provides Right to _____
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19. In the Indian Constitution as per Fundamental Rights, Abolition of Untouchability is a _____
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20. Directive Principles of State policy is borrowed from which Country.
    a) Japan   b) Ireland   c) America   d) Russia

21. In which part of the Constitution , DPSP are mentioned?
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    c) Fundamental Duties   d) Fifth Schedule

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    c) Liberal Intellectual Directives   d) Intellectual Directives

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   b) Ramnath Kovind
   c) M. Venkaiah Naidu
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   c) 24 years
   d) 30 years

29. What is the age limit for Rajya Sabha contestant?
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   b) 35 years
   c) 25 years
   d) 31 years

30. Who is the present Lok Sabha Speaker?
   a) Birla
   b) Shri Birla
   c) Om Birla
   d) GD Birla

31. When is the Budget Session month happens in Lok Sabha?
   a) July to September
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   d) November to January

32. What is the minimum total Quorum to be present during the Lok Sabha Sessions?
   a) $\frac{1}{12}$ th
   b) $\frac{1}{10}$ th
   c) $\frac{1}{50}$ th
   d) $\frac{1}{15}$ th

33. Who is the present Chief Justice of India?
   a) D.Y. Chandrachud
   b) N.V. Ramana
   c) Jagdeep Dhankar
   d) None of these

34. Karnataka has bicameral system of State Legislature. Bicameral means
   a) Two Cameras
   b) Lok Sabha and Rajya Sabha
   c) Vidhan Sabha and Vidhan Parishad
   d) Only Vidhan Sabha

35. How many Highcourts are there in India?
   a) 29
   b) 25
   c) 24
   d) 18

36. Under a single, integrated, hierarchical Judicial system, the High Courts in the states are directly under the
   a) President
   b) Governor of the State
   c) Union Parliament
   d) Supreme Court

37. The Supreme Court was set up under
   a) Pitts India Act
   b) Regulating Act
   c) Indian Council Act 1861
   d) Indian Councils Act 1892

38. A Judge of the Supreme Court will be removed on the basis of violation of Constitutional principles through
   a) Impeachment
   b) Retirement
   c) Appointment
   d) Judgment

39. Who is the Present Governor of Karnataka?
   a) Rama Devi
   b) Thawar Chand Gehlot
   c) Vajuhbhaiwala
   d) HR Bhardwaj

Version – A - 3 of 4

40. Original Jurisdiction of the Supreme Court includes :
    a) Appeals in Civil cases
    b) Appeals in Criminal cases
    c) Interstate disputes
    d) All of these

41. Chief Election Commissioner of India can be removed from the office by _____
    a) Both of houses of Parliament
    b) Union Council of Minister
    c) President of India
    d) Both a and b option combined

42. Who among the following was the first Chief Election Commissioner of India
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44. The Emergency Provisions of Indian Constitution have been borrowed from
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    b) Japan
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45. How many types of emergencies are there in Constitution of India?
    a) 1
    b) 2
    c) 3
    d) 4

46. President can Proclaim a Financial Emergency under which among the following Articles?
    a) Article 350
    b) Article 352
    c) Article 356
    d) Article 360

47. Which among the following Articles gives the power to the Central Government to take Pre – emptive action to protect any State against External aggression and Internal disturbances?
    a) Article 355
    b) Article 358
    c) Article 356
    d) Article 360

48. Enact means
    a) Single chapter
    b) Single action
    c) Past a Law
    d) Rectify the mistakes in the Law

49. Election Commission does not conduct Election to
    a) The office of the President
    b) The office of the Vice – President
    c) The office of the Speaker of Lok Sabha
    d) State Legislature and Union Territory

50. Once the Proclamation of Financial Emergency is declared or approved by the Parliament it continues for
    a) Another six months
    b) One Year
    c) Two Years
    d) Indefinitely

* * * * *

Version – A - 4 of 4

USN ☐☐☐☐☐☐☐☐☐☐

Question Paper Version : B

First Semester B.E./B. Tech Degree Examination, Jan./Feb. 2023
Indian Constitution

Time: 1 hrs.   Max. Marks: 50

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    b) Directive Principles of State Policy
    c) Fundamental Duties
    d) Fifth Schedule

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* * * * *

Version – B - 4 of 4

USN ⬜⬜⬜⬜⬜⬜⬜⬜⬜⬜

Question Paper Version : C

First Semester B.E./B. Tech Degree Examination, Jan./Feb. 2023
Indian Constitution

Time: 1 hrs.   Max. Marks: 50

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    a)   1   b)   2   c)   3   d)   4

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26. Under a single, integrated, hierarchical Judicial system, the High Courts in the states are directly under the
    a)   President   b)   Governor of the State
    c)   Union Parliament   d)   Supreme Court

27. The Supreme Court was set up under
    a)   Pitts India Act   b)   Regulating Act
    c)   Indian Council Act 1861   d)   Indian Councils Act 1892

28. A Judge of the Supreme Court will be removed on the basis of violation of Constitutional principles through
    a)   Impeachment   b)   Retirement   c)   Appointment   d)   Judgment

29. Who is the Present Governor of Karnataka?
    a)   Rama Devi   b)   Thawar Chand Gehlot
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30. Original Jurisdiction of the Supreme Court includes :
    a)   Appeals in Civil cases   b)   Appeals in Criminal cases
    c)   Interstate disputes   d)   All of these

31. Which of the following writ is issued by the Supreme Court if it sends an order to restrain a person from acting in an office to which he is not entitled.
    a)   Habeas corpus   b)   Prohibition   c)   Cestiorari   d)   Quo warranto

32. Which of the following right mentioned in the Indian Constitution is absolute in nature?
    a)   Right to Equality   b)   Right to Freedom of Religion
    c)   Right to Constitutional Remedies   d)   Right to get equal pay for equal work

33. Which of the following Articles of the Constitution of India covers the Right to Freedom?
    a)   Articles 19 to 22   b)   Articles 29 to 30   c)   Article 32   d)   Articles 14 to 18

34. During National emergency which of the following provision stands suspended.
    a)   DPSP   b)   Amendment procedures
    c)   Fundamental Rights   d)   Judicial Review

35. Which Fundamental Right ceased to be a Fundamental Right and became a Legal Right under the 44th Amendment of the Indian Constitution.
    a)   Right to Property   b)   Right to Primary Education
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36. Fundamental Rights in the Indian Constitution have been taken from the
    a)   Russian Constitution   b)   US Constitution
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38. Article 21A of the Constitution of India provides Right to _____
    a)   Work   b)   Privacy   c)   Equality   d)   Education

39. In the Indian Constitution as per Fundamental Rights, Abolition of Untouchability is a _____
    a)   Right to Equality   b)   Right to Freedom of Religion
    c)   Right against Exploitation   d)   Right to Constitutional Remedy

40. Directive Principles of State policy is borrowed from which Country.
    a) Japan　　　　　b) Ireland　　　　c) America　　　　d) Russia

41. The Indian Constitution is
    a) Based on Conventions　　　　　b) A brief document
    c) An evolved constitution　　　　d) Written and bulky document

42. The Constituent Assembly adopted the Indian Constitution on
    a) August 15, 1947　b) November 26, 1949　c) January 26, 1950　d) January 26, 1948

43. The Constitution of India declares India as
    a) A Unitary State　　　　　b) A Federation
    c) A Quasi federal State　　d) A Union of States

44. The Constitution of India is
    a) Levitary in form but federal in spirit　　b) Levitary with strong federal bias
    c) Is full of strong levitary features　　　d) Federal in form , but levitary in spirit

45. Chairman of the Drafting Committee was
    a) Dr. B. R. Ambedkar　　　　b) Dr. Rajendra Prasad
    c) Jagajeevan Ram　　　　　d) Jawaharlal Nehru

46. What is the present number of Articles in Indian Constitution?
    a) 395　　　　　b) 376　　　　　c) 445　　　　　d) 448

47. Which Amended Act added the word "Secular" in Constitution of India?
    a) 42nd Amendment　b) 44th Amendment　c) 45th Amendment　d) 46th Amendment

48. The Government of India Act 1935 provided for
    a) Diarchy at the center　　　b) Establishment of federal court
    c) Provincial Autonomy　　　d) All of the above

49. The Constituent Assembly of India started its work in 1946 and completed its work in
    a) November 1949　b) Jan. 1949　　c) Dec. 1948　　d) Jan. 1950

50. The Preamble of the Constitution of India has been amended so far
    a) Four times　　b) Thrice　　　c) Twice　　　d) Once

* * * * *

Version – C - 4 of 4

CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐

First Semester B.E./B. Tech Degree Examination, Jan./Feb. 2023
Indian Constitution

Time: 1 hrs.   Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

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1. When is the Budget Session month happens in Lok Sabha?
   a) July to September   b) February to May
   c) April to May   d) November to January

2. What is the minimum total Quorum to be present during the Lok Sabha Sessions?
   a) $\frac{1}{12}$ th   b) $\frac{1}{10}$ th   c) $\frac{1}{50}$ th   d) $\frac{1}{15}$ th

3. Who is the present Chief Justice of India?
   a) D.Y. Chandrachud   b) N.V. Ramana   c) Jagdeep Dhankar   d) None of these

4. Karnataka has bicameral system of State Legislature. Bicameral means
   a) Two Cameras   b) Lok Sabha and Rajya Sabha
   c) Vidhan Sabha and Vidhan Parishad   d) Only Vidhan Sabha

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   a) 29   b) 25   c) 24   d) 18

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    a) Four times   b) Thrice   c) Twice   d) Once

21. Chief Election Commissioner of India can be removed from the office by _____
    a) Both of houses of Parliament
    b) Union Council of Minister
    c) President of India
    d) Both a and b option combined

22. Who among the following was the fist Chief Election Commissioner of India
    a) K. V. K Sundaram
    b) Sukumar Sen
    c) M. Patanjali Sastry
    d) S. P. Sen Verma

23. Who is the Present Chief Election Commissioner in India?
    a) Sunil Arora   b) Suohil Chandra   c) Rajiv Kumar   d) Om Prakash Rawat

24. The Emergency Provisions of Indian Constitution have been borrowed from
    a) Germany   b) Japan   c) USSR   d) USA

25. How many types of emergencies are there in Constitution of India?
    a) 1   b) 2   c) 3   d) 4

26. President can Proclaim a Financial Emergency under which among the following Articles?
    a) Article 350   b) Article 352   c) Article 356   d) Article 360

27. Which among the following Articles gives the power to the Central Government to take Pre – emptive action to protect any State against External aggression and Internal disturbances?
    a) Article 355   b) Article 358   c) Article 356   d) Article 360

28. Enact means
    a) Single chapter
    b) Single action
    c) Past a Law
    d) Rectify the mistakes in the Law

29. Election Commission does not conduct Election to
    a) The office of the President
    b) The office of the Vice – President
    c) The office of the Speaker of Lok Sabha
    d) State Legislature and Union Territory

30. Once the Proclamation of Financial Emergency is declared or approved by the Parliament it continues for
    a) Another six months   b) One Year   c) Two Years   d) Indefinitely

31. In which part of the Constitution , DPSP are mentioned?
    a) Part III   b) Part IV   c) Part VII   d) Part VIII

32. Promoting Education and Economic interests of weaker sections of the society, especially the SC and ST comes under which of the following?
    a) Fundamental Rights
    b) Directive Principles of State Policy
    c) Fundamental Duties
    d) Fifth Schedule

33. Which of the following statement is not correct about the Directive Principles of State Policy?
    a) It determines to establish a "Welfare State"
    b) It is the duty of the Citizen to apply DPSP Principles in making laws
    c) To secure Uniform Civil Code for Citizen
    d) To Ensure Equal pay for both Men and Women at Work.

34. Which one among of the subsequent isn't the Directive Principles of State Policy?
    a) Socialistic Directives
    b) Gandhian Directives
    c) Liberal Intellectual Directives
    d) Intellectual Directives

35. Who is the Present Vice President of India?
    a) Droupadi Murmu
    b) Ramnath Kovind
    c) M. Venkaiah Naidu
    d) Jagdeep Dhankar

36. With reference to the Constitution of India, which of the following statement is not correct?
    a) The Prime Minister shall be appointed by the President
    b) Council of Ministers are appointed by the Prime Minister
    c) Council of Minister shall be collectively responsible to Lok Sabha
    d) Ministers hold office during the pleasure of the President.

37. The Chancellor for all the Universities in the State is
    a) Chief Minister
    b) Education Minister
    c) Governor of the State
    d) High Court Chief Justice

38. What is the age limit to contest for Lok Sabha Elections
    a) 25 years   b) 26 years   c) 24 years   d) 30 years

39. What is the age limit for Rajya Sabha contestant?
    a) 30 years   b) 35 years   c) 25 years   d) 31 years

40. Who is the present Lok Sabha Speaker?
    a) Birla   b) Shri Birla   c) Om Birla   d) GD Birla

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* * * * *

CBCS SCHEME

USN ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚

| Question Paper Version : A |

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Innovation & Design Thinking

Time: 1 hr.] [Max. Marks: 50

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1. What is design considerations are not linked with?
   a) Products b) Services c) Business d) Computers

2. To Empathize, one has to,
   a) Observe b) Engage c) Listen d) All of the above

3. _____ story telling is the most compelling type of story,
   a) Aural b) Visual c) Textual d) All of these

4. Design thinker in an organization are,
   a) People b) Employees c) Managers d) All of these

5. Comprehensive principle of Design thinking does not include
   a) Relationship b) Collaboration c) Communication d) Suppliers

6. In design, where does the information used to put together a problem statement come from?
   a) The Design Stage b) The Ideate Stage
   c) The Define stage d) The testing stage

7. MVP stands for,
   a) Minimum Viable product b) Maximum Viable Product
   c) Most viable product d) None of these

8. Journey mapping is also called _____ mapping.
   a) Path b) Experience c) Conduct d) Feedback

9. Which of the following are NOT tools of Design Thinking?
   a) Co-creation b) Prototyping c) Mind mapping d) Online marketing

10. A Prototype is a simple experimental model of a proposed solution used to,
   a) Test ideas   b) Validate ideas   c) both   d) None of these

11. What is your First model/design of a product called?
   a) Draft   b) Rough Draft   c) Prototype   d) Practice Design

12. The final step in the Design process is to _____
   a) Test   b) Define   c) Ideate   d) Empathize

13. _____ was IDEO's first expression of design thinking.
   a) Deep-Design   b) Deep-Dive   c) Deep-Structure   d) Study-Dive

14. Frank Robinson defined and coined the term.
   a) Design thinking   b) Mind mapping   c) MVP   d) Hypothesis

15. Which of the below is incorrect?
   a) Peprico has turned Design Thinking into its strategy.
   b) Air BnB avoided bankruptcy and turned profitable using Design Thinking
   c) Google has a 3 step process to bring about new innovation
   d) All of the above are correct

16. At what step do you want to complete the POV-Point Of View?
   a) Empathy   b) Prototype   c) Define   d) Ideate

17. The initial design brief iS provided by,
   a) Designer   b) User   c) Both of them   d) Client

18. What Element of user Experience Design would the design strategy fall under,
   a) Interaction Design   b) Experience strategy
   c) User Research   d) Information Architecture

19. When testing a new prototype, how many people do you need to interview per Persona to detect the main usability issues?
   a) The more Persona the better   b) 20 Persons per Persona
   c) 10 Persons per Persona   d) Five Persons per Persona

20. Readiness of the organization for strategic innovation means,
   a) Changing innovation process in the organization
   b) Ready for the change in the organization
   c) Ready for change in the capabilities of the organization
   d) All of the above

21. What is the usual order of problem solving process?
   a) Try, Reflect, Prepare, Define   b) Prepare, Try Define, Reflect
   c) Try and Reflect   d) Define, Prepare, Try, Reflect

22. Reframing a Design Challenge -
   a) Changes the Conceptual view point to an individual perspective
   b) Helps us come up with the Right Problem to solve.
   c) Challenges us to design to a marketing focus
   d) None of these

23. Which of the following is true?
  a) By Empathizing one can define a Problem Well, Conceive a creative solution resulting in break through innovation.
  b) Empathy makes you a better human, but innovation requires out of the box thinking and not Empathy
  c) Inventions are sudden Eureka moments and is not really part of the long-term Research or Exploration.
  d) You become an innovator by Questioning the status Quo.

24. Malini is in the Ideate phase. What is her goal?
  a) To Come up with one or two great ideas
  b) To come up with us many ideas as possible, good and bad.
  c) To test his best idea.
  d) To figure out which problem he's going to solve

25. During which stage would you : start looking for a alternative ways of viewing the problem.
  a) Prototype   b) Define   c) Ideate   d) Empathize

26. Design Thinkers create low-fidelity prototypes to :
  a) Test concepts quickly and cheaply with potential users.
  b) Validate concepts for the market.
  c) Build Production-Ready products.
  d) Estimate the price of production

27. Which of the following well known consulting firms are offering Design Thinking as a solution?
  a) McKinsey & Co.   b) BCG
  c) Bain & Co.   d) All of above

28. Design Thinking is sometimes visualized as a linear process, but it is actually :
  a) Impactful   b) Incapacitating   c) Intentional   d) Iterative

29. Which of the following is NOT part of the idea-selection process in DT?
  a) Grouping Related concepts together   b) Identifying selection criteria
  c) Deliberating   d) Prototyping

30. Robert researches statistics about the average age of school dropouts. Which stage is he in?
  a) Empathize   b) Define problem statement
  c) Ideate   d) Prototype

31. Design thinking Approach leads to -
  a) Technology centric designs   b) Marketing centric designs
  c) People centric designs   d) All of the above

32. Design-Impacts the business
  a) True   b) False

33. Empathy is -
  a) to understand people and the contexts of their use of a product
  b) to know the way the product works
  c) to imagine people's behavior in different contexts
  d) None of these

34. Design thinking encompasses -
a) Desirability
b) Feasibility
c) Viability
d) All of these

35. Which one of the following is not the mindset of a design thinker?
a) Quick design
b) Prototype refinement
c) Coding
d) Engineer product

36. Which of the following is not the mindset of a Design Thinker?
a) Make it
b) Learn from Failure
c) Self oriented
d) Empathy

37. Where does the information for defining the problem in the define phase come from?
a) The Terting stage
b) The prototype stage
c) The Ideate stage
d) The Empathize stage

38. Crafting a Point Of View (POV) requires three key elements including all of these Except which?
a) Design   b) User   c) Insight   d) Need

39. Who is the recommended group that you should test out the prototypes with?
a) Your target customers
b) People in your team
c) Professional designers
d) Experts

40. Which is not one of the types of prototype of prototyping Mode 1?
a) Horizontal prototype
b) Vertical Prototype
c) Diagonal prototype
d) Domain prototype

41. Which of the following is the least true about open innovation?
a) It accelerates development process
b) It reduces cost of product development.
c) It helps in creating product differentiation
d) It helps to beat competition

42. People Centered Design methodology involves,
a) A problem-solving approach for people that is linear and convergent.
b) A problem-solving approach which is abstract and Results in making people by products.
c) A problem solving approach for people that both diverges and converges.
d) None of these

43. User journey map helps you to,
a) Understand the touch point and pain points of the user.
b) iterate, iterate, iterate
c) Identify the user's credibility, expertise and skills.
d) None of these

44. What is the role of the Define Stage of design thinking?
a) To define the parameters for a prototype.
b) To define the audience, you're trying to Reach.
c) To define the problem that needs to be solved.
d) To define all of the ideas for solving a problem.

45. What is a problem statement in design thinking?
a) A written expression of problems from the prototype.
b) A written expression of the problem to be solved.
c) A written expression of problems inside the group.
d) A written expression of problems with target market.

46. What purpose does Point Of Veiw (POV) serve in design thinking?
a) It serves as the guide for developing the prototype.
b) It illustrates what your competitors are doing better.
c) It is used in the testing phase for receiving feedback.
d) It provides focus for the design team's brain storming.

47. In this Point of View (POV) statement, which part is considered the insight? "Senior adults with arthrit is need Easy-Open bottles because they struggle to open childproof lids"
a) Because they struggle to open childproof lids.
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c) Senior citizens
d) None of these

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a) A Report from the design team about the product.
b) A Customer's opinion about interactions with you brand.
c) A written statement of a Customer's problem of need.
d) The opinion of the manager about how to brain storm.

49. Where do the insights in Point Of View (POV) in design thinking come from?
a) Researching other products on the market.
b) Interviewing the general Public on Social media.
c) Synthesizing the data that has been gathered
d) Developing ideas during brainstorming

50. People centered Design is -
a) How the product behaves in the real context.
b) How a product works on the outside where a person comes into contact with it and has to use it.
c) All of the above
d) None of the above

* * * * *

BIDTK158

USN ☐☐☐☐☐☐☐☐☐☐

Question Paper Version : **B**

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Innovation & Design Thinking

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a) Try, Reflect, Prepare, Define   b) Prepare, Try Define, Reflect
c) Try and Reflect   d) Define, Prepare, Try, Reflect

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47. Which of the following well known consulting firms are offering Design Thinking as a solution?
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50. Robert researches statistics about the average age of school dropouts. Which stage is he in?
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* * * * *

Version B – 5 of 5

USN ☐☐☐☐☐☐☐☐☐☐

Question Paper Version : C

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Innovation & Design Thinking

Time: 1 hr.]   [Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **fifty** questions, each question carries one mark.

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    a) Technology centric designs   b) Marketing centric designs
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    a) True   b) False

23. Empathy is -
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    a) Desirability   b) Feasibility
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25. Which one of the following is not the mindset of a design thinker?
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BIDTK158

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Innovation & Design Thinking

Time: 1 hr.]

[Max. Marks: 50

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* * * * *

CBCS SCHEME

BMATC101

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Mathematics – I for Civil Engineering Stream

Time: 3 hrs.   Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	With usual notations prove that $\tan\phi = r\dfrac{d\theta}{dr}$.	6	L2	CO1
	b.	Find the angle between the curves $r = 6\cos\theta$ and $r = 2(1+\cos\theta)$.	7	L2	CO1
	c.	For the curve $r^m = a^m \cos m\theta$, prove that $\rho = \dfrac{a^m}{(1+m)r^{m-1}}$.	7	L2	CO1
		OR			
Q.2	a.	Derive an expression for the radius of curvature for a Cartesian curve.	7	L2	CO1
	b.	Find the Pedal equation of the curve $\dfrac{2a}{r} = 1+\cos\theta$.	8	L2	CO1
	c.	Using Modern mathematical tool. Write a program / code to plot the sine and cosine curve.	5	L3	CO5
		Module – 2			
Q.3	a.	Expand $\sqrt{1+\sin 2x}$ by using Maclaurin's series up to the term containing x^4.	6	L2	CO1
	b.	If $u = f(r,s,t)$ and $r = \dfrac{x}{y}$, $s = \dfrac{y}{z}, t = \dfrac{z}{x}$. Show that, $x\dfrac{\partial u}{\partial x} + y\dfrac{\partial u}{\partial y} + z\dfrac{\partial u}{\partial z} = 0$.	7	L2	CO1
	c.	Examine the function $f(x,y) = x^3 + y^3 - 3x - 12y + 20$ for extreme values.	7	L3	CO1
		OR			
Q.4	a.	If $z = e^{ax+by}f(ax-by)$ then prove that $b\dfrac{\partial z}{\partial x} + a\dfrac{\partial z}{\partial y} = 2abz$.	7	L2	CO1
	b.	If $u = x^2 + y^2 + z^2$, $v = xy + yz + zx$, $w = x + y + z$ find $\dfrac{\partial(u,v,w)}{\partial(x,y,z)}$.	8	L2	CO1
	c.	Using Modern mathematical tool write a program/code to evaluate $\underset{x\to\infty}{\text{lt}}\left(1+\dfrac{1}{x}\right)^x$.	5	L3	CO5
		Module – 3			
Q.5	a.	Solve : $\dfrac{dy}{dx} + y\tan x = y^3 \sec x$.	6	L2	CO2
	b.	Find the orthogonal trajectories of the family of the curves $r^n = a^n \sin n\theta$.	7	L3	CO2
	c.	Solve : $xy\left(\dfrac{dy}{dx}\right)^2 - (x^2 + y^2)\dfrac{dy}{dx} + xy = 0$.	7	L2	CO2
		OR			
Q.6	a.	Solve : $(y^4 + 2y)dx + (xy^3 + 2y^4 - 4x)dy = 0$.	6	L2	CO3
	b.	A body in air at 25°C cools from 100°C to 75°C in one minute. Find the temperature of the body at the End of 3 minutes.	7	L3	CO2

	c.	Find the general solution of the equation $x^2(y-px)=p^2y$ by reducing into Clairaut's form using the substitution $X=x^2$, $Y=y^2$.	**7**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	Solve : $\left(4D^4-8D^3-7D^2+11D+6\right)y=0$.	**6**	**L2**	**CO3**
	b.	Solve : $\left(D^2+5D+6\right)y=\cos x+e^{-2x}$.	**7**	**L2**	**CO3**
	c.	Solve by the method of variation of parameters $\dfrac{d^2y}{dx^2}+a^2y=\sec ax$.	**7**	**L2**	**CO3**
		OR			
Q.8	**a.**	Solve : $\dfrac{d^2y}{dx^2}-4\dfrac{dy}{dx}+5y=0$ subject to $\dfrac{dy}{dx}=2$, $y=1$ at $x=0$.	**6**	**L2**	**CO3**
	b.	Solve : $\dfrac{d^2y}{dx^2}+4y=x^2+\cos 2x$.	**7**	**L2**	**CO3**
	c.	Solve : $x^3\dfrac{d^3y}{dx^3}+3x^2\dfrac{d^2y}{dx^2}+x\dfrac{dy}{dx}+8y=65\cos(\log x)$.	**7**	**L2**	**CO3**
		Module – 5			
Q.9	**a.**	Find the rank of the matrix $\begin{bmatrix} -2 & -1 & -3 & -1 \\ 1 & 2 & 3 & 1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}$.	**6**	**L2**	**CO4**
	b.	Solve the system of equations by Gauss-Jordan method $x+y+z=9$, $2x+y-z=0$, $2x+5y+7z=52$.	**7**	**L2**	**CO4**
	c.	Using Rayleigh's power method find the dominant eigen value and the corresponding eigen vector of $\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$ by taking $\begin{bmatrix}1 & 1 & 1\end{bmatrix}^1$ as the initial eigen vector. Carryout 6 iterations.	**7**	**L3**	**CO4**
		OR			
Q.10	**a.**	Find the rank of the matrix. $\begin{bmatrix} 91 & 92 & 93 & 94 & 95 \\ 92 & 93 & 94 & 95 & 96 \\ 93 & 94 & 95 & 96 & 97 \\ 94 & 95 & 96 & 97 & 98 \\ 95 & 96 & 97 & 98 & 99 \end{bmatrix}$.	**7**	**L2**	**CO4**
	b.	Solve the system of equations, $20x+y-2z=17$, $3x+20y-z=-18$, $2x-3y+20z=25$. Using Gauss-Seidel method, taking $(0,\ 0,\ 0)$ as an initial approximation (carry out 3 iterations).	**8**	**L2**	**CO4**
	c.	Using modern mathematical tool write a program/code to test the consistency of the equations. $x_1+2x_2-x_3=1$, $2x_1+x_2+5x_3=2$, $3x_1+3x_2+4x_3=1$.	**5**	**L3**	**CO5**

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USN ☐☐☐☐☐☐☐☐☐☐ **BMATE101**

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Mathematics - I for Electrical and Electronics Engineering Stream

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	**M**	**L**	**C**
Q.1	**a.**	If ϕ is the angle between the radius vector and tangent to the polar curve $r = t(\theta)$, prove that $\tan\phi = r\dfrac{d\theta}{dr}$.	6	L2	CO1
	b.	Find the angle between the curves $r = \operatorname{Sin}\theta + \operatorname{Cos}\theta$ and $r = 2\operatorname{Sin}\theta$.	7	L2	CO1
	c.	Find the radius of curvature of the curve $x^3 + y^3 = 3axy$ at $\left(\dfrac{3a}{2}, \dfrac{3a}{2}\right)$.	7	L2	CO1
		OR			
Q.2	**a.**	Prove that the polar curves $r = a(1 + \operatorname{Cos}\theta)$ and $r = b(1 - \operatorname{Cos}\theta)$ intersect orthogonally.	6	L2	CO1
	b.	Find the radius of curvature of the curve $y = 4\operatorname{Sin} x - \operatorname{Sin} 2x$ at $x = \dfrac{\pi}{2}$.	7	L2	CO1
	c.	Using Modern mathematical tool, write a program / code to plot the curve $r = 2\,|\operatorname{Cos} 2\theta|$.	7	L3	CO5
		Module – 2			
Q.3	**a.**	Expand $f(x) = \operatorname{Cos} x + \operatorname{Sin} x$ in a Maclaurin series upto the term involving x^5.	6	L2	CO2
	b.	If $U = \log(\tan x + \tan y + \tan z)$, show that $\operatorname{Sin} 2x\,\dfrac{\partial u}{\partial x} + \operatorname{Sin} 2y\,\dfrac{\partial u}{\partial y} + \operatorname{Sin} 2z\,\dfrac{\partial u}{\partial z} = 2$.	7	L2	CO2
	c.	If $u = x^2 + y^2 + z^2$, $v = xy + yz + zx$, $w = x + y + z$, find $\dfrac{\partial(u,v,w)}{\partial(x,y,z)}$.	7	L2	CO2
		OR			
Q.4	**a.**	Evaluate $\displaystyle\lim_{x\to 0}\left(\dfrac{a^x + b^x + c^x + d^x}{4}\right)^{\frac{1}{x}}$.	6	L1	CO2
	b.	If $V = f(x-y , y - z , z - x)$, show that $\dfrac{\partial v}{\partial x} + \dfrac{\partial v}{\partial y} + \dfrac{\partial v}{\partial z} = 0$.	7	L2	CO2
	c.	Using modern mathematics tool, write a program / code to show that $U_{xx} + U_{yy} = 0$. Given $U_3 = e^x(x\operatorname{Cos} y - y\operatorname{Sin} y)$.	7	L3	CO2

		Module – 3			
Q.5	a.	Solve $(5x^4 + 3x^2y^2 - 2xy^3)\,dx + (2x^3y - 3x^2y^2 - 5y^4)\,dy = 0$.	6	L2	CO3
	b.	Find the Orthogonal trajectory of the family of confocal ellipses $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2 + \lambda} = 1$, where λ is a parameter.	7	L3	CO3
	c.	Solve $xyp^2 - (x^2 + y^2)\,p + xy = 0$.	7	L2	CO3
		OR			
Q.6	a.	Solve $\dfrac{dy}{dx} + y\,\tan x = y^2\,\sec x$.	6	L2	CO3
	b.	Find the current i at any time t , if initially there is no current in the circuit governed by the differentiate equation $L\left(\dfrac{di}{dt}\right) + Ri = 200\,\mathrm{Sin}\,300t$, when $L = 0.05$ and $R = 100$.	7	L3	CO3
	c.	Find the general solution of the equation $(px - y)\,(py + x) = a^2 p$ by reducing into Clairaut's form, taking the substitution $X = x^2$, $Y = y^2$.	7	L2	CO3
		Module – 4			
Q.7	a.	Evaluate $\displaystyle\int_{0}^{1} \int_{x}^{\sqrt{x}} xy\,dy\,dx$, by changing the order of integration.	6	L2	CO4
	b.	Evaluate $\displaystyle\int_{-p}^{1} \int_{0}^{z} \int_{x-z}^{x+z} (x + y + z)\,dy\,dx\,dz$.	7	L2	CO4
	c.	Prove that $\beta(m, n) = \dfrac{\Gamma(m)\,\Gamma(n)}{\Gamma(m + n)}$.	7	L1	CO4
		OR			
Q.8	a.	Evaluate $\displaystyle\int_{0}^{1} \int_{0}^{\sqrt{1-y^2}} (x^2 + y^2)\,dx\,dy$ by changing to polar coordinates.	6	L2	CO4
	b.	Using double integration, find the area bounded by the parabolas $y^2 = 4ax$ and $x^2 = 4ay$.	7	L3	CO4
	c.	Show that $\displaystyle\int_{0}^{\pi/2} \sqrt{\mathrm{Sin}\,\theta}\,d\theta \times \int_{0}^{\pi/2} \dfrac{d\theta}{\sqrt{\mathrm{Sin}\,\theta}} = \pi$ by using Beta and Gamma functions.	7	L2	CO4
		Module – 5			
Q.9	a.	Find the rank of the matrix $\begin{bmatrix} 2 & 1 & 3 & 5 \\ 4 & 2 & 1 & 3 \\ 8 & 4 & 7 & 13 \\ 8 & 4 & -3 & -1 \end{bmatrix}$.	6	L2	CO5

	b.	Solve the system of linear equations by Gauss – Jordan method. $x + y + z = 11$ $3x – y + 2z = 12$ $2x + y – z = 3$.	**7**	**L2**	**CO5**
	c.	Determine the largest eigen value and the corresponding eigen vector of the matrix. $A = \begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$ by using Power method with initial eigen vector $X_o = [1\ 0\ 0]^T$. Carry out six iterations.	**7**	**L2**	**CO5**
		OR			
Q.10	**a.**	For what values of λ and μ the system of equations $x + y + z = 6$, $x + 2y + 3z = 10$ and $x + 2y + \lambda z = \mu$ may have i) Unique solution ii) Infinite number of solution iii) No solution.	**6**	**L2**	**CO5**
	b.	Solve by using Gauss elimination method the equations $3x + y – z = 3$; $2x – 8y + z = -5$; $x – 2y + 9z = 8$.	**7**	**L2**	**CO5**
	c.	Using modern mathematical tool, write a program / code to find the largest eigen value of $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$ by power method.	**7**	**L3**	**CO5**

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CBCS SCHEME

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BMATM101

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Mathematics – I for Mechanical Engineering Stream

Time: 3 hrs.　　　　　　　　　　　　　　　　　　　　Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
*　　　 2. VTU Formula Hand Book is permitted.*
*　　　 3. M : Marks , L: Bloom's level , C: Course outcomes.*

		Module – 1	M	L	C
Q.1	**a.**	With usual notations prove that $\tan \phi = \dfrac{r d\theta}{dr}$.	6	L2	CO1
	b.	Find the pedal equation of $r^n = a^n \cos n\theta$	7	L2	CO1
	c.	Find the angle of intersection of the curves $r = a(1 + \cos\theta)$, $r = b(1 - \cos\theta)$	7	L2	CO1
		OR			
Q.2	**a.**	Derive the radius of curvature for the Cartesian curve.	7	L2	CO1
	b.	Find the angle between the polar curves $r = a\log\theta$, $r = \dfrac{a}{\log\theta}$	8	L2	CO1
	c.	Using modern mathematical tool write a program/code to plot sine and cosine curves.	5	L3	CO5
		Module – 2			
Q.3	**a.**	Expand $\sqrt{1 + \sin 2x}$ by Maclaurin's series upto the terms containing x^4.	6	L2	CO2
	b.	If $U = f(x - y, y - z, z - x)$, show that $\dfrac{\partial U}{\partial x} + \dfrac{\partial U}{\partial y} + \dfrac{\partial U}{\partial z} = 0$.	7	L2	CO2
	c.	Examine the function $f(x, y) = x^3 + 3xy^3 + 15x^2 - 15y^2 + 72x$ for extreme values.	7	L3	CO2
		OR			
Q.4	**a.**	Evaluate $\displaystyle\lim_{x \to 0}\left(\dfrac{a^x + b^x + c^x + d^x}{4}\right)^{\frac{1}{x}}$.	6	L2	CO2
	b.	If $U = x^2 + y^2 + z^2$, $V = xy + yz + zx$, $W = x + y + z$, find $\dfrac{\partial(U, V, W)}{\partial(x, y, z)}$.	7	L2	CO2
	c.	Using modern mathematical tool to write a program/code to evaluate $\displaystyle\lim_{x \to \infty}\left(1 + \dfrac{1}{x}\right)^x$	7	L3	CO5
		Module – 3			
Q.5	**a.**	Solve $\dfrac{dy}{dx} + \dfrac{y\cos x + \sin y + y}{\sin x + x\cos y + x} = 0$.	6	L2	CO3
	b.	If the air is maintained at 30ºC and the temperature of the body cools from 80ºC to 60ºC in 12 minutes, Find the temperature of the body after 24 minutes.	7	L3	CO3
	c.	Find the general and singular solutions of $xp^2 + xp - yp + 1 - y = 0$.	7	L2	CO3

OR

Q.6	a.	Solve $\dfrac{dy}{dx} + x \sin 2y = x^3 \cos^2 y$.	6	L2	CO3
	b.	Show that the parabola $y^2 = 4a(x + a)$ is self orthogonal.	7	L3	CO3
	c.	Solve $xyp^2 - (x^2 + y^2)\,p + xy = 0$.	7	L2	CO3

Module – 4					
Q.7	a.	Solve $(D^4 - 4D^3 + 8D^2 - 8D + 4)\, y = 0$.	6	L2	CO3
	b.	Solve $(D^2 - 6D + 9)y = 6e^{3x} + 7e^{-2x} - \log 2$.	7	L2	CO3
	c.	Solve by variation of parameters $(D^2 + 1)\, y = \sec x$.	7	L2	CO3

OR

Q.8	a.	Solve $(D^2 - 4D + 13)\, y = \cos 2x$.	6	L2	CO3
	b.	Solve $y'' + 3y' + 2y = 12x^2$.	7	L2	CO3
	c.	Solve $(x^2)y'' - xy' + y = \log x$.	7	L2	CO3

Module – 5					
Q.9	a.	Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 & 1 \\ 2 & 1 & -1 & 0 \\ 3 & 3 & 2 & 1 \\ 2 & 4 & 6 & 2 \end{bmatrix}$	6	L2	CO4
	b.	For what values λ and μ the system equations, $2x + 3y + 5z = 9$, $7x + 3y - 2z = 8$, $2x + 3y + \lambda z = \mu$, has i) No solution ii) a unique solution iii) infinite number of solutions.	7	L2	CO4
	c.	Solve the system of equations using Gauss Seidel method by taking $(0, 0, 0)$ as an initial conditions $10x + y + z = 12$, $x + 10y + z = 12$, $x + y + 10x = 12$.	7	L2	CO4

OR

Q.10	a.	Using Gauss – Jordon method, solve $x + y + z = 11$, $3x - y + 2z = 12$, $2x + y - z = 3$.	7	L2	CO4
	b.	Using Rayleigh's power method find the dominant eigen value and the corresponding eigen vector of $\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$ by taking $[1 \ \ 0 \ \ 0]^T$ as the initial eigen vector. [Carry out 6 iterations].	8	L2	CO4
	c.	Using modern mathematical tool write a program/code to test the consistency of the equations $x + 2y - z = 1$, $2x + y + 4x = 2$, $3x + 3y + 4z = 1$.	5	L3	CO5

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BMATS101

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Mathematics – I for Computer Science Engineering Stream

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	With usual notations, prove that $\tan\phi = r\dfrac{d\theta}{d\gamma}$.	6	L2	CO1
	b.	Find the angle of intersection between the curves $\gamma = \dfrac{a\theta}{1+\theta}$, $\gamma = \dfrac{a}{1+\theta^2}$.	7	L2	CO1
	c.	Find radius of curvature of the curve $y = a\log\sec\left(\dfrac{x}{a}\right)$ at any point (x, y).	7	L2	CO1
		OR			
Q.2	a.	With usual notations prove that $\dfrac{1}{p^2} = \dfrac{1}{r^2} + \dfrac{1}{r^4}\left(\dfrac{dr}{d\theta}\right)^2$.	8	L2	CO1
	b.	Find the radius of the curvature of the curve $r = a(1 + \cos\theta)$.	7	L2	CO1
	c.	Using modern mathematical tool write a program/code to plot the Sine and Cosine curve.	5	L3	CO5
		Module – 2			
Q.3	a.	Using Maclaurin's series prove that $\sqrt{1+\sin 2x} = 1 + x - \dfrac{x^2}{2!} - \dfrac{x^3}{3!} + \dfrac{x^4}{4!} + \ldots\ldots$	6	L2	CO1
	b.	If $Z = e^{ax+by}\, f(ax-by)$, prove that $b\dfrac{\partial z}{\partial x} + a\dfrac{\partial z}{\partial y} = 2abz$.	7	L2	CO1
	c.	Find the extreme values of the function $f(x, y) = x^3 + y^3 - 3x - 12y + 20$.	7	L3	CO1
		OR			
Q.4	a.	Evaluate $\displaystyle\lim_{x \to 0}\left(\dfrac{a^x + b^x + c^x + d^x}{4}\right)^{1/x}$.	8	L2	CO1
	b.	If $u = \dfrac{2yz}{x}$, $v = \dfrac{3xz}{y}$, $w = \dfrac{4xy}{z}$ find $J\left(\dfrac{u,v,w}{x,y,z}\right)$.	7	L2	CO1

	c.	Using modern mathematical tool write a program code to evaluate $\underset{x \to \infty}{Lt} \left(1 + \frac{1}{x}\right)^x$.	5	L3	CO5

		Module – 3			
Q.5	a.	Solve $\dfrac{dy}{dx} + y \tan x = y^3 \sec x$.	6	L2	CO2
	b.	Find orthogonal trajectories of family of curves $r^n = a^n \cos n\theta$.	7	L3	CO2
	c.	Solve $x^2 p^2 + 3xyp + 2y^2 = 0$.	7	L2	CO2

		OR			
Q.6	a.	Solve $(x^2 + y^2 + x)dx + xy\,dy = 0$.	6	L2	CO2
	b.	Find the general solution of the equation $(px – y)(py + x) = 2p$ by reducing into Clairaut's form by taking the substitution $X = x^2$, $Y = y^2$.	7	L2	CO2
	c.	A 12 volts battery is connected to a series circuit in which the inductance is $\frac{1}{2}$ Henry and resistance is 10 ohms. Determine current I, if the initial current is zero.	7	L3	CO2

		Module – 4			
Q.7	a.	i) Find the last digit in 13^{37}. ii) Find the remainder when 7^{118} is divided by 10.	6	L2	CO3
	b.	Find the solutions of the linear congruence $12x \equiv 6(\bmod 21)$.	7	L2	CO3
	c.	Find the general solution of linear Dio-phantine equation $70x + 112y = 168$.	7	L2	CO3

		OR			
Q.8	a.	Find the remainder when 14! Is divided by 17.	6	L2	CO3
	b.	Find the solution of system of linear congruences $7x + 3y \equiv 10(\bmod 16)$ $2x + 5y \equiv 9(\bmod 16)$	7	L2	CO3
	c.	Solve $x \equiv 3(\bmod 5)$, $x \equiv 2(\bmod 6)$, $x \equiv 4(\bmod 7)$ using Chinese remainder theorem.	7	L3	CO3

		Module – 5			
Q.9	a.	Find the rank of matrix $A = \begin{bmatrix} 0 & 1 & -3 & -1 \\ 1 & 0 & 1 & 1 \\ 3 & 1 & 0 & 2 \\ 1 & 1 & -2 & 0 \end{bmatrix}$.	6	L2	CO4

	b.	Solve the system of equations by Gauss-Jordan method. $x + y + z = 9$; $2x + y - z = 0$; $2x + 5y + 7z = 52$.	**7**	**L3**	**CO4**
	c.	Find the largest eigen value and the corresponding eigen vector of the matrix $A = \begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$ taking $\begin{bmatrix} 1 & 1 & 1 \end{bmatrix}^T$ as initial eigen vector, using power method.	**7**	**L3**	**CO4**
... OR					

Q.10	**a.**	Find the values of λ and μ for which the system $x + y + z = 6$; $x + 2y + 3z = 10$; $x + 2y + \lambda z = \mu$ has i) Unique solution ii) Infinitely many solutions iii) no solution.	**8**	**L2**	**CO4**
	b.	Solve the following system of equations by Gauss-Elimination method $2x + y + 4z = 12$, $4x + 11y - z = 33$, $8x - 3y + 2z = 20$.	**7**	**L3**	**CO4**
	c.	Using modern mathematical tool, write a program/code to test the consistency of the equations $x + 2y - z = 1$, $2x + y + 4z = 2$, $3x + 3y + 4z = 1$.	**5**	**L3**	**CO5**

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First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Applied Physics for CSE Stream

Time: 3 hrs.   Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain the construction and working of a semiconductor laser with the help of energy level diagram.	8	L2	CO1
	b.	What is refractive index profile? Discuss three different types of optical fibres based on modes of propagation and refractive index profile.	7	L2	CO1
	c.	The angle of acceptance of an optical fibre is 30° when kept in air. Find the angle of acceptance when it is in a medium of refractive index 1.33.	5	L3	CO5
		OR			
Q.2	a.	Define acceptance angle and numerical aperture. Derive an expression for numerical aperture in terms of refractive indices of core, cladding and surrounding.	8	L2	CO1
	b.	Derive an expression for energy density for a system in thermal equilibrium in terms of Einstein's co-efficient.	7	L2	CO1
	c.	In a diffraction grating experiment the laser light undergoes second order diffraction for diffraction angle 1.48°. The grating constant is 5.08×10^{-5} m and the distance between the grating and the source is 80 cm, find the wave length of LASER light.	5	L3	CO5
		Module – 2			
Q.3	a.	Assuming the time independent Schrodinger's wave equation discuss the solution for a particle in one dimensional potential well of infinite height and hence obtain the normalized wave equation.	9	L2	CO2
	b.	State and explain Heisenberg uncertainty principle. Show that an electron doesn't exists inside the nucleus.	7	L2	CO2
	c.	Compute the deBroglie wavelength for a neutron moving with one tenth part of velocity of light. Given the mass of the neutron is 1.674×10^{-27} kg.	4	L3	CO2
		OR			
Q.4	a.	Setup Schrodinger time independent wave equation in one dimension.	9	L2	CO2
	b.	Define phase velocity and group velocity. Derive an expression for De Broglie wavelength of an electron.	7	L2	CO2
	c.	An electron has a speed of 100 m/s. The inherent uncertainty in its measurement is 0.005%. Calculate the corresponding uncertainty in the measurement of the position.	4	L3	CO2
		Module – 3			
Q.5	a.	Explain the Pauli matrices and apply Pauli matrices on the state $\lvert 0 \rangle$ and $\lvert 1 \rangle$.	9	L2	CO2
	b.	Differentiate between classical and quantum computing.	6	L2	CO2
	c.	Explain the Hadamard gate. Show that the Hadamard gate is unitary.	5	L2	CO2

		OR			
Q.6	a.	A Linear operator 'X' operates such that $X\|0\rangle = \|1\rangle$ and $X\|1\rangle = \|0\rangle$. Find the matrix representation of 'X'.	5	L2	CO2
	b.	Describe the working of CNOT gate mentioning its matrix representation and truth table.	9	L2	CO2
	c.	Explain the representation of qubit using Bloch sphere.	6	L2	CO2
		Module – 4			
Q.7	a.	Enumerate the failures of classical free electron theory and discuss the success of quantum free electron theory of metals.	8	L2	CO3
	b.	Explain DC and AC Josephson effects and mention any two applications of superconductivity in quantum computing.	7	L2	CO3
	c.	Find the temperature at which there is 1% probability that a state with an energy 0.5 eV above the Fermi energy is occupied.	5	L3	CO3
		OR			
Q.8	a.	Explain Meissner's effect and the variation of critical field with temperature.	8	L2	CO3
	b.	Define Fermi factor. Discuss the variation of Fermi factor with temperature and energy.	7	L2	CO3
	c.	The critical temperature of Nb is 9.15 K. At zero Kelvin, the critical field is 0.196T. Calculate the critical field at 8 K.	5	L3	CO3
		Module – 5			
Q.9	a.	Discuss timing in Linear motion, Uniform motion, Slow in and Slow out.	8	L2	CO4
	b.	Describe Jumping and parts of jumping in animation.	7	L2	CO4
	c.	A slowing-in object in an animation has a first frame distance 0.5 m and first slow in frame 0.35 m. Calculate the base distance and the number of frames in sequence.	5	L3	CO5
		OR			
Q.10	a.	Illustrate the odd rule and odd rule multiplier with suitable example.	8	L2	CO4
	b.	Discuss modeling the probability for proton decay.	7	L2	CO4
	c.	In an optical fibre experiment the Laser light propagating through optical fibre cable of 1.5 m, made a spot diameter of 8 mm on the screen. The distance between the end of the optical fibre cable and the screen is 3.4 cm. Calculate the angle of contact and numerical aperture of given optical fibre.	5	L3	CO5

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CBCS SCHEME

USN | | | | | | | | | |

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Introduction to Python Programming

Time: 3 hrs.   Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	What is the need for role of precedence? Illustrate the rules of precedence in Python with example.	6	L2	CO1
	b.	Explain the local and global scope with suitable examples.	6	L2	CO1
	c.	Develop a program to generate Fibonacci sequence of length (N). Read N from the console.	8	L3	CO1
		OR			
Q.2	a.	What are functions? Explain Python function with parameters and return statements.	7	L2	CO1
	b.	Define exception handling. How exceptions are handled in python? Write a program to solve divide by zero exception.	7	L2	CO1
	c.	Develop a python program to calculate the area of rectangle and triangle print the result.	6	L3	CO1
		Module – 2			
Q.3	a.	Explain negative indexing, slicing, index( ), append( ), remove( ), pop( ), insert( ) and sort( ) with suitable example.	8	L2	CO2
	b.	Explain the use of in and not in operators in list with suitable examples.	6	L2	CO2
	c.	Develop a program to find mean, variance and standard deviation.	6	L3	CO2
		OR			
Q.4	a.	Explain the following methods in lists with an examples: i) len( ) ii) sum( ) iii) max( ) iv) min( ).	8	L2	CO2
	b.	Explain set( ) and setdefault( ) method in a dictionary.	6	L2	CO2
	c.	Develop a Python program to swap cases of a given string input: Java output: jAVA.	6	L3	CO2
		Module – 3			
Q.5	a.	Explain join( ) and split( ) method with examples.	8	L2	CO3
	b.	Explain with examples: i) isalpha( ) ii) isalnum( ) iii) isspace( ).	6	L2	CO3
	c.	Develop a python code to determine whether the given string is a palindrome or not a palindrome.	6	L3	CO3

		OR			
Q.6	a.	Explain the concept of file handling. Also explain reading and writing process with suitable example.	8	L2	CO3
	b.	Explain the concept of file path. Also discuss absolute and relative file path.	6	L2	CO3
	c.	Briefly explain saving variables with shelve module.	6	L3	CO3
		Module – 4			
Q.7	a.	Explain the following file operations in Python with suitable example: i) Copying files and folders ii) Moving files and folders iii) Permanently deleting files and folders.	6	L2	CO3
	b.	List out the benefits of compressing file? Also explain reading of a zip file with an example.	8	L2	CO3
	c.	List out the differences between shutil.copy( ) and shutil.copytree( ) method.	6	L3	CO3
		OR			
Q.8	a.	Briefly explain assertions and raising a exception.	6	L2	CO3
	b.	List out the benefits of using logging module with an example.	6	L2	CO3
	c.	Develop a program with a function named DivExp which takes two parameters a, b and returns a value C (C = a/b). Write suitable assertion for a > 0 in function DivExp and raise an exception for when b = 0. Develop a suitable program which reads two values from the console and calls a function DivExp.	8	L3	CO3
		Module – 5			
Q.9	a.	Define a class and object, construct the class called rectangle and initialize it with height = 100, width = 200, starting point as (x = 0, y = 0). Write a program to display the center point co-ordinates of a rectangle.	8	L2	CO4
	b.	Explain the concept of copying using copy module with an example.	6	L2	CO4
	c.	Explain the concept of inheritance with an example.	6	L2	CO4
		OR			
Q.10	a.	Define a function which takes two objects representing complex numbers and returns new complex number with a addition of two complex numbers. Define a suitable class 'Complex' to represent the complex number. Develop a program to read N(N > = 2) complex numbers and to compute the addition of N complex numbers.	8	L2	CO4
	b.	Explain _ _init_ _( ) and _ _str_ _( ) method with examples.	6	L2	CO4
	c.	Briefly explain the printing of objects with an examples.	6	L2	CO4

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BPLCK105C / BPLCKC105

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Basics of Java Programming

Time: 3 hrs.

Max. Marks: 100

*Note: **1.** **Answer any FIVE full questions, choosing ONE full question from each module.***
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain three main object oriented principles.	6	L2	CO1
	b.	Give the list of separators used in Java programming.	6	L1	CO1
	c.	Write a Java program to display sum of odd and even numbers from the elements in an array.	8	L3	CO1
		OR			
Q.2	a.	Explain different types of integer literal with example.	6	L2	CO1
	b.	Give the syntax of different types of array allocation in Java.	6	L1	CO1
	c.	Write a Java program for multiplication of two arrays.	8	L3	CO1
		Module – 2			
Q.3	a.	Explain the following operations with example i) $\wedge$ ii) | iii) << iv) >>>	8	L2	CO2
	b.	Demonstrate the working of enhanced for loop in Java.	6	L2	CO2
	c.	Write a program to demonstrate the working of ternary operator.	6	L3	CO2
		OR			
Q.4	a.	With example demonstrate the working of Do loop and Do while loop in Java.	8	L2	CO2
	b.	Demonstrate the working of labeled break in Java.	6	L2	CO2
	c.	Write a Java program to sort list of elements in ascending order.	6	L3	CO2
		Module – 3			
Q.5	a.	Explain two types of constructors in Java.	6	L2	CO3
	b.	Demonstrate method overloading with example.	6	L2	CO3
	c.	Write a program to perform stack operation using proper class and methods.	8	L3	CO3

		OR			
Q.6	**a.**	Explain static variable and static method in Java.	6	L2	CO3
	b.	Write a note on Garbage collection in Java.	6	L2	CO3
	c.	Explain how call by value and call by reference work in Java.	8	L3	CO3
		Module – 4			
Q.7	**a.**	Explain different types of inheritance in Java.	8	L2	CO3
	b.	Demonstrate the working of super keyword in Java.	6	L2	CO3
	c.	Give an example for method overrading.	6	L2	CO3
		OR			
Q.8	**a.**	What is an abstract class? Explain with example.	6	L2	CO3
	b.	Explain the working of i) final class ii) final method.	6	L2	CO3
	c.	Give an example for dynamic dispatch.	8	L2	CO3
		Module – 5			
Q.9	**a.**	Demonstrate the working of access modifiers in all the classes of JAVA with two different packages.	10	L2	CO4
	b.	With example demonstrate the working of interfaces in JAVA.	10	L3	CO4
		OR			
Q.10	**a.**	What is an Exception? With example demonstrate different mechanisms of handling exceptions in JAVA.	10	L2	CO4
	b.	What are uncaught Exceptions? How to create our own exceptions. Explain with the program.	10	L3	CO4

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BPOPS103

First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
Principles of Programming using C

Time: 3 hrs.   Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain the organization of Basic computer model with neat diagram.	8	L1	CO2
	b.	Explain Input/Output statement in C.	8	L1	CO2
	c.	List and explain any two input-output devices.	4	L1	CO2
		OR			
Q.2	a.	What are the basic datatypes available in C?	6	L2	CO2
	b.	Define variable. Explain the rules to declare a variable with example.	6	L2	CO2
	c.	With suitable example – Explain the basic structure of C program.	8	L2	CO2
		Module – 2			
Q.3	a.	What is type casting? Explain its types with suitable example.	6	L2	CO2
	b.	Write a C program to find the largest of three numbers using ternary operator.	6	L3	CO2
	c.	List and explain unconditional branching statements with example.	8	L1	CO2
		OR			
Q.4	a.	List the conditional branching statements in 'C'. Explain any two with example.	6	L1	CO2
	b.	Write a C program to compute the roots of a quadratic equation by accepting the coefficients print appropriate messages.	6	L3	CO2
	c.	Explain different types of loops in C. Justify with its syntax and example.	8	L2	CO2
		Module – 3			
Q.5	a.	Define an array. Explain with example. How to declare and initialize 2D-array.	6	L2	CO3
	b.	Write a C program to search an element using binary search technique (for numericals).	6	L3	CO3
	c.	Write a C program to perform addition of 2-dimensional matrix (consider 3×3 ordered matrices A and B).	8	L3	CO3
		OR			

Q.6	a.	Define function. Explain the type of functions based on parameters.	8	L2	CO3
	b.	Write a C program to sort the elements using bubble sort technique by passing array as function argument.	6	L3	CO4
	c.	Write a C program to find the n_{C_r} . $\left[n_{C_r} = \dfrac{n!}{(n-r)!r!} \right]$	6	L3	CO3

Module – 4						
Q.7	a.	Define a string. List the string manipulation functions. Explain any two with examples.	8	L2	CO2
	b.	Write a C program to find the length of a given string without using built-in function.	6	L3	CO3
	c.	Write a C program to check whether the given string is Palindrome or not without using built in function.	6	L3	CO2

OR						
Q.8	a.	Define Pointer. Explain how the pointer is declared and initialized with example.	6	L2	CO4
	b.	Write a C program using pointers to compute the sum, mean and standard deviation of all elements stored in an array of 'n' real numbers.	8	L3	CO4
	c.	Write a C program to replace each constant in a string with the text one except letter 'z', 'Z' and 'a''A', for the string "Corona Virus" should be modified as "DpSpoa Wjsvt".	6	L3	CO3

Module – 5						
Q.9	a.	Differentiate between structures and Union.	6	L2	CO4
	b.	Write a C program to implement structures to read and write Book-Title, Book-Author and Book-id of n books.	8	L3	CO3
	c.	Write a note on files.	6	L3	CO4

OR						
Q.10	a.	List and explain any four file operations in C.	6	L2	CO2
	b.	Write a C program to store and print name, USN, Subject and IA marks of students using structure.	8	L3	CO4
	c.	Write a note on enumerated data type.	6	L2	CO4

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