



# FY-All Branch

Shri Balasaheb Mane Shikshan Prasarak Mandal, Ambap's  
**ASHOKRAO MANE GROUP OF INSTITUTIONS**  
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**QUESTION PAPER: (B.Tech/M.Tech/MBA)**

Class: **FY**

Dept: **APP Sci.**

Exam date: / / 20

Paper Quantity:.....

**July 2023**

<b>DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE</b> <b>End Semester Regular Summer Examination – 2022-23</b> <b>Course: B. Tech.                      Branch :                      Semester : II</b> <b>Subject Code &amp; Name: BTHM204, Communication Skills</b> <b>Max Marks: 60                      Date:                      Duration: 3 Hr.</b>			
<b>Instructions to the Students:</b> 1. All the questions are compulsory. 2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question. 3. Assume suitable data wherever necessary and mention it clearly.			
		(Level/CO)	Marks
<b>Q.1</b>	<b>Solve any TWO of the following:</b>		<b>12</b>
A)	Explain the types/forms of communication.	Understand/1	<b>6</b>
B)	Discuss any three barriers to communication.	Understand/1	<b>6</b>
C)	Write a short note on importance of reading skills.	Understand/1	<b>6</b>
<b>Q.2</b>	<b>Solve any TWO of the following:</b>		<b>12</b>
A)	What are the principles of practicing Group Discussion (GD)?	Remember/3	<b>6</b>
B)	Write a detailed note on non-verbal communication.	Remember/1	<b>6</b>
C)	Discuss interview techniques.	Understand/3	<b>6</b>
<b>Q.3</b>	<b>Solve any TWO of the following:</b>		<b>12</b>
A)	Write the spelling for the following transcriptions. i. /kəm'pju:tə(r)/ ii. /ɪg.zæmɪ'neɪʃn/ iii. /'jestədeɪ/	Remember/2	<b>6</b>
B)	Draw a diagram of Organs of Speech. Explain any three organs of speech.	Apply/2	<b>6</b>
C)	What is the role of phonetics in effective English communication?	Remember/2	<b>6</b>
<b>Q.4</b>	<b>Solve any TWO of the following:</b>		<b>12</b>
A)	I) Fill in the blanks with the appropriate article/s (a, an and the). i. Vinod wants to join _____ university. ii. You are _____ honest person. iii. Rahul is _____ Mahendra Singh Dhoni of our college.	Apply/4	<b>6</b>

	<p>II) Fill in the blanks with the appropriate preposition (from, since, up, between, on, under).</p> <p>i. He has been writing _____ morning.</p> <p>ii. Sudha sits _____ Saroj and Usman.</p> <p>iii. What is the documentary _____?</p>		
B)	<p>I) Rewrite the sentences using the correct tense.</p> <p>i. Simran _____ (go) to her village last week. (Simple Past Tense)</p> <p>ii. I _____ (teach) this subject for ten years (Present Perfect Continuous Tense)</p> <p>iii. He _____ (open) the shop everyday (Simple Present Tense)</p> <p>II) Write the synonyms of the following words:</p> <p>i. Abandon</p> <p>ii. Illiterate</p> <p>iii. Zenith</p>	Apply/4	6
C)	<p>1) Write the antonyms of the following words:</p> <p>i. Arrogant</p> <p>ii. Ancient</p> <p>iii. Virtue</p> <p>2) Correct the following sentences:</p> <p>iv. He is my older brother.</p> <p>v. My friend lives in abroad.</p> <p>vi. I love travel.</p>	Apply/4	6
Q. 5	Solve any ONE of the following:		12
A)	<p>1) Write a detailed report on an activity arranged by your college. (For example, Blood Donation Camp, Tree Plantation Drive, etc....)</p> <p>2) Write an application to your H o D requesting three days leave for your sister's marriage ceremony.</p>	Remember/4	6
OR			
B)	<p>Use Full Block Format and write an application for the post of Asst. Engineer in Tata Consultancy Services (TCS), No. 11/2 Palace Road, Bangalore. (The Times of India, 10<sup>th</sup> July 2023)</p> <p>Attach your CV/Resume.</p>	Remember/4	12
*** End ***			

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	<p>II) Fill in the blanks with the appropriate preposition (from, since, up, between, on, under).</p> <p>i. He has been writing _____ morning.</p> <p>ii. Sudha sits _____ Saroj and Usman.</p> <p>iii. What is the documentary _____?</p>		
B)	<p>I) Rewrite the sentences using the correct tense.</p> <p>i. Simran _____ (go) to her village last week. (Simple Past Tense)</p> <p>ii. I _____ (teach) this subject for ten years (Present Perfect Continuous Tense)</p> <p>iii. He _____ (open) the shop everyday (Simple Present Tense)</p> <p>II) Write the synonyms of the following words:</p> <p>i. Abandon</p> <p>ii. Illiterate</p> <p>iii. Zenith</p>	Apply/4	6
C)	<p>1) Write the antonyms of the following words:</p> <p>i. Arrogant</p> <p>ii. Ancient</p> <p>iii. Virtue</p> <p>2) Correct the following sentences:</p> <p>iv. He is my older brother.</p> <p>v. My friend lives in abroad.</p> <p>vi. I love travel.</p>	Apply/4	6
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A)	<p>1) Write a detailed report on an activity arranged by your college. (For example, Blood Donation Camp, Tree Plantation Drive, etc....)</p> <p>2) Write an application to your H o D requesting three days leave for yours sister's marriage ceremony.</p>	Remember/4	6
	OR		6
B)	<p>Use Full Block Format and write an application for the post of Asst. Engineer in Tata Consultancy Services (TCS), No. 11/2 Palace Road, Bangalore. (The Times of India, 10<sup>th</sup> July 2023)</p> <p>Attach your CV/Resume.</p>	Remember/4	12
*** End ***			

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**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE**

**Summer Examination – 2023**

**Course: B. Tech.**

**Branch : FE All**

**Semester : II**

**Subject Code & Name: Engineering Mathematics-II (BTBS201)**

**Max Marks: 60**

**Date: 12-07-2023**

**Duration: 3 Hr.**

**Instructions to the Students:**

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

		(Level/CO )	Marks
Q.1	Solve Any Two of the following.		12
A)	If $\tan(A + iB) = x + iy$ then show that i) $\tan 2A = \frac{2x}{1-x^2-y^2}$ ii) $\tanh 2B = \frac{2y}{1+x^2+y^2}$	Understand (CO1)	6
B)	Show that the roots of $x^5 = 1$ are $1, \alpha, \alpha^2, \alpha^3, \alpha^4$ and hence prove that $(1 - \alpha)(1 - \alpha^2)(1 - \alpha^3)(1 - \alpha^4) = 5$	Understand (CO1)	6
C)	Prove that $\tan \left[ i \log \left( \frac{a-ib}{a+ib} \right) \right] = \frac{2ab}{a^2-b^2}$	Understand (CO1)	6
Q.2	Solve Any Two of the following.		12
A)	Solve $\frac{dy}{dx} + x \sin 2y = x^3 \cos^2 y$	Understand (CO2)	6
B)	Solve $y dx - x dy + \log x dx = 0$	Understand (CO2)	6
C)	A constant electromotive force $E$ volts is applied to a circuit containing a constant resistance $R$ ohm in series and a constant inductance $L$ Henries. If the initial current is zero, show that the current builds up to half its theoretical maximum in $\left( \frac{L}{R} \log 2 \right)$ seconds.	Apply (CO2)	6
Q.3	Solve Any Two of the following.		12
A)	Solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = e^x + xe^x \cos x$	Understand (CO3)	6
B)	Solve $(D^2 + 2D + 1)y = e^{-x} \log x$ by method of variation of parameters	Understand (CO3)	6
C)	Solve $x^2 \frac{d^2y}{dx^2} - 2x \frac{dy}{dx} + 2y = x^2$	Understand (CO3)	6
Q.4	Solve Any Two of the following.		12
A)	Find the Fourier series of the function $f(x) = x$ in the interval $(0, 2\pi)$ .	Understand (CO4)	6
B)	Find the Fourier series of $f(x) = x^2$ in the interval $-\pi < x < \pi$ and hence show that $\frac{\pi^2}{6} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots$	Understand (CO4)	6



C)	<p>If <math>f(x) = \begin{cases} x &amp; , \quad 0 &lt; x &lt; \frac{\pi}{2} \\ \pi - x &amp; , \quad \frac{\pi}{2} &lt; x &lt; \pi \end{cases}</math> then find half range Fourier sine series</p> <p>Hence show that <math>f(x) = \frac{4}{\pi} \left( \sin x + \frac{\sin 3x}{3^2} + \frac{\sin 5x}{5^2} + \dots \right)</math></p>	Understand (CO4)	6
Q. 5	Solve Any Two of the following.		12
A)	<p>If <math>\vec{r} = xi + yj + zk</math> and <math>r =  \vec{r} </math> then Find <math>\nabla \cdot \vec{F}</math>,</p> <p>where <math>\vec{F} = \left(\frac{x}{r}\right)i + \left(\frac{y}{r}\right)j + \left(\frac{z}{r}\right)k</math></p>	Understand (CO5)	6
B)	Verify Green's theorem for $\oint_C (xy + y^2)dx + x^2dy$ where $C$ is bounded by $y = x$ and $y = x^2$	Understand (CO5)	6
C)	Verify the Stokes theorem for $\vec{F} = x^2i + xyj$ over the square in the plane $z = 0$ bounded by the lines $x = 0, x = a, y = 0$ and $y = a$	Apply (CO5)	6
*** End ***			

<b>DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE</b> <b>End Semester Regular Summer Examination – 2022-23</b> <b>Course: B. Tech.                      Branch :                      Semester : II</b> <b>Subject Code &amp; Name: BTHM204, Communication Skills</b> <b>Max Marks: 60                      Date:                      Duration: 3 Hr.</b>			
<b>Instructions to the Students:</b> 1. All the questions are compulsory. 2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question. 3. Assume suitable data wherever necessary and mention it clearly.			
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C)	Write a short note on importance of reading skills.	Understand/1	6
<b>Q.2</b>	<b>Solve any TWO of the following:</b>		<b>12</b>
A)	What are the principles of practicing Group Discussion (GD)?	Remember/3	6
B)	Write a detailed note on non-verbal communication.	Remember/1	6
C)	Discuss interview techniques.	Understand/3	6
<b>Q. 3</b>	<b>Solve any TWO of the following:</b>		<b>12</b>
A)	Write the spelling for the following transcriptions. i. /kəm'pju:tə(r)/ ii. /ɪg,zæm'i'neɪʃn/ iii. /'jestədeɪ/	Remember/2	6
B)	Draw a diagram of Organs of Speech. Explain any three organs of speech.	Apply/2	6
C)	What is the role of phonetics in effective English communication?	Remember/2	6
<b>Q.4</b>	<b>Solve any TWO of the following:</b>		<b>12</b>
A)	I) Fill in the blanks with the appropriate article/s (a, an and the). i. Vinod wants to join _____ university. ii. You are _____ honest person. iii. Rahul is _____ Mahendra Singh Dhoni of our college.	Apply/4	6



	<p>II) Fill in the blanks with the appropriate preposition (from, since, up, between, on, under).</p> <p>i. He has been writing _____ morning.</p> <p>ii. Sudha sits _____ Saroj and Usman.</p> <p>iii. What is the documentary _____?</p>		
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<b>C)</b>	<p>1) Write the antonyms of the following words:</p> <p>i. Arrogant</p> <p>ii. Ancient</p> <p>iii. Virtue</p> <p>2) Correct the following sentences:</p> <p>iv. He is my older brother.</p> <p>v. My friend lives in abroad.</p> <p>vi. I love travel.</p>	Apply/4	6
<b>Q. 5</b>	<b>Solve any ONE of the following:</b>		
<b>A)</b>	<p>1) Write a detailed report on an activity arranged by your college. (For example, Blood Donation Camp, Tree Plantation Drive, etc....)</p> <p>2) Write an application to your H o D requesting three days leave for yours sister's marriage ceremony.</p>	Remember/4	12 6 6
	OR		
<b>B)</b>	<p>Use Full Block Format and write an application for the post of Asst. Engineer in Tata Consultancy Services (TCS), No. 11/2 Palace Road, Bangalore. (The Times of India, 10<sup>th</sup> July 2023)</p> <p>Attach your CV/Resume.</p>	Remember/4	12
	*** End ***		

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**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE**  
**End Semester Examination – Summer 2023**

Date:-14/07/2023

Course: B.Tech.  
Subject: Engineering Chemistry  
Marks: 60

Sem: II  
Subject code: BTBS202  
Duration: 3 hr.

**Instructions for students:**

1. All the questions are compulsory.
2. Draw a neat labelled diagram wherever necessary.
3. Read question properly

Q1 Solve any TWO of the following:	Level/CO	Marks
A) Explain the zeolite process of softening of water with its advantages and disadvantages.	(understanding)	06
B) Explain in detail Hot-Lime Soda process with its advantages and disadvantages.	(understanding)	06
C) How does the Hardness of water determine by EDTA complexometric method.	(Apply)	06
<b>Q2. Solve any TWO of the following:</b>		
A) State phase rule equation. Explain the term component of phase rule with examples.	(Understanding)	06
B) Explain phase diagram of one component water system with neat labelled diagram.	(Understanding)	06
C) What is meant by Eutectic point? Explain silver-lead 2 component alloy system with phase diagram.	(application)	06
<b>Q3. Solve any TWO of the following:</b>		
A) Write a note on Dry/Chemical corrosion. Explain mechanism of corrosion due to oxygen.	(knowledge)	06
B) Suggest the criteria for selection of metal and role of proper designing for corrosion control.	(understanding)	06
C) Define Anodic protection method and explain the process with the help of neat labelled diagram.	(knowledge)	06
<b>Q4. Solve any TWO of the following:</b>		
A) Define Calorific value and the concept of Gross and Net calorific value.	(knowledge)	06
B) What are the conditions under which solid lubricants are used and write a note on Graphite.	(application)	06
C) Describe Fractional distillation process with neat labelled diagram and give end use of each fraction.	(Understanding)	06
<b>Q5 Solve any TWO of the following</b>		
A) Define Ohm's law, Specific conductance, equivalent conductance, molecular conductance, and cell constant with their units.	(Understanding)	06

- |    |   |                |    |
|----|---|----------------|----|
| B) | B) Write a note on Ostwald's theory of acid base indicators.  | (knowledge)    | 06 |
| C) | C)What is conductometric titration? Explain<br>conductometric titration of strong acid versus strong base<br>with graphical representation. | ( Application) | 06 |



DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2023

Course: B. Tech.

Branch: All

Semester: II

Subject Code & Name: BTBS202P (Engineering Physics)

Max Marks: 60

Date: 14/07/2023

Duration: 3 Hr.

**Instructions to the Students:**

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

	(Level/CO)	Marks
<b>Q. 1 Solve Any Two of the following.</b>		
A) Define Damped Vibrations. Set up differential equation for damped vibrations.	(CO1) (Remember & Understand)	6
B) Explain the construction, working for production of ultrasonic waves using Piezoelectric oscillator.	(CO1) (Understand)	6
C) State any two applications of ultrasonic waves. Calculate the length of iron rod which can be used to produce ultrasonic waves of 20 KHz. Density of iron is $7.23 \times 10^3 \text{ kg/m}^3$ , Young's modulus is $11.6 \times 10^{10} \text{ N/m}^2$	(CO1) (Remember & Understand)	6
<b>Q.2 Solve Any Two of the following.</b>		
A) In Newton's rings, derive an expression for diameter of $n^{\text{th}}$ bright ring and dark ring.	(CO2) (Understand)	6
B) Explain the construction & working of Ruby laser.	(CO2) (Understand)	6
C) Explain the structure of optical fiber with suitable diagram. Calculate the numerical aperture of a optical fiber with core index $n_1=1.61$ and cladding index $n_2=1.55$	(CO2) (Remember & Understand)	6
<b>Q. 3 Solve Any Two of the following.</b>		
A) With neat diagram, explain the construction & working of Bainbridge mass spectrograph.	(CO3) (Understand)	6
B) Write short note on Geiger Muller Counter.	(CO3) (Understand)	6
C) State Heisenberg's Uncertainty Principle with formula.	(CO3)	6

If the uncertainty in position of an electron is  $4 \times 10^{-10}$  m, Calculate the uncertainty in its momentum. ( $h = 6.62 \times 10^{-34}$  J Sec)

(Understand)

**Q.4 Solve the following questions.**

- A) Calculate Atomic Packing Fraction for SC, BCC and FCC lattices.

(CO4)

(Understand)

- B) Explain Continuous X-ray spectra.

Calculate the wavelength of X-rays when a potential difference of 30 KV is applied between filament and anode.

(CO4)

(Understand)

**Q.5 Solve Any Two of the following.**

- A) Explain Diamagnetic, Paramagnetic and Ferromagnetic materials with examples and diagram.

(Understand)

- B) Distinguish between Type I and Type II superconductors.

(Understand)

- C) Derive an expression for conductivity of Intrinsic and extrinsic (P Type & N Type) Semiconductors.

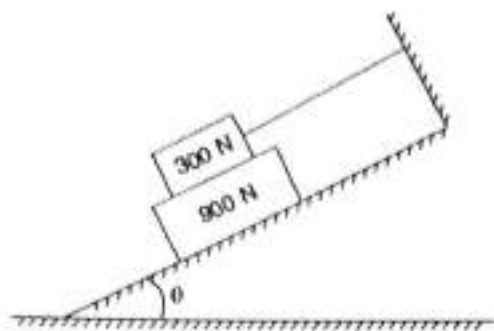
(Understand)

\*\*\* End \*\*\*

- B) What should be the value of  $\theta$  that will make the motion of 900 N block down the plane to impend? The coefficient of friction for all contact surfaces is  $1/3$ .  
(Note: Upper block weighs 300 N)

CO2

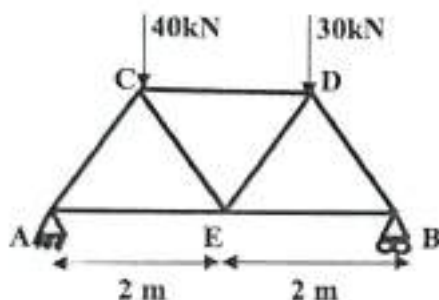
06



- C) Find out forces in all the members of truss. (All angles are  $60^\circ$ )

CO2

06



**Q. 4 Solve Any Two of the following.**

- A) State and prove work energy principle.
- B) A body moves along a straight line and its acceleration ' $a$ ' which varies with time is given by  $a = 2 - 3t$ . Five seconds after start of the observations, its velocity is found to be 20 m/sec. Ten seconds after start of the observation, the body is at 85 m from the origin. Determine its acceleration, velocity and distance from the origin.
- C) If a particle is projected inside a horizontal tunnel which is 5 meters high with velocity of 60 m/s, find the angle of projection and the greatest possible range.

Understand

06

CO 4

06

CO 4

06

**Q. 5 Solve Any Two of the following.**

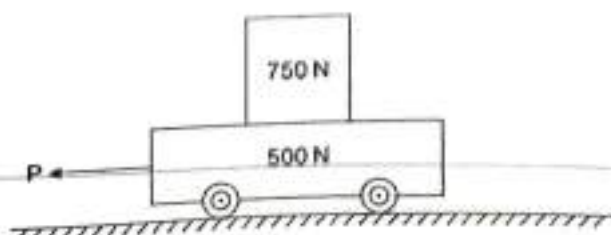
- A) State and explain with mathematical equation: (i) Law of conservation of momentum (ii) Coefficient of restitution.
- B) A 750 N crate rests on a 500 N cart. The coefficient of friction between the crate and the cart is 0.3 and between cart and the road is 0.2. If the cart is to be pulled by a force  $P$  such that the crate does not slip.

Remember

06

CO 5

06





Using D' Alembert's principle, determine:

- (i) the maximum allowable magnitude of P,
- (ii) the corresponding acceleration of the cart.

- C) A 1500 N block is in contact with a level plane, the coefficient of friction between two contact surfaces being 0.1. If the block is acted upon by a horizontal force of 300 N, what time will elapse before the block reaches a velocity of 16 m/sec starting from rest? If 300 N force is then removed, how much longer will the block continue to move? Solve the problem using impulse momentum equation.

CO 5

06

\*\*\* End \*\*\*

# DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular Semester Examination – Summer 2023

Course: First Year B. Tech. (Semester II)

Branch: Group A / Group B

Subject Name: Engineering Mechanics

Subject Code: BTES203

Max Marks: 60

Date: 17/07/2023

Duration: 3 Hrs.

## Instructions to the Students:

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

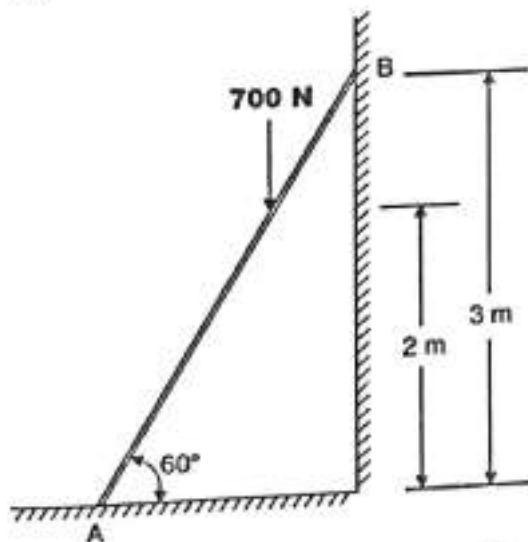
(Level/CO) Marks

### Q.1 Solve Any Two of the following.

- A) (I) Define following terms: Static, Dynamic, Law of parallelogram, Lami's Theorem. **Remember 06**

(II) Write down the characteristics of force.

- B) A ladder weighing 100 N is to be kept in the position shown in figure, resting on a smooth floor and leaning on a smooth wall, also a man weighing 700 N is at 2m above floor level. Determine (i) The horizontal force F required at floor level to prevent it from slipping. (ii) If the horizontal force F is to be applied at a height of 1 m above the ground level, how much should F be? **CO 1 06**



**CO 1 06**

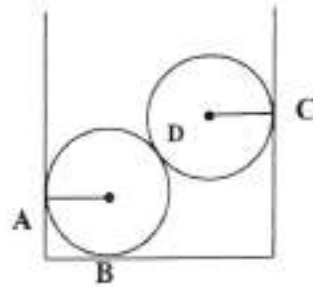
- C) The following forces are acting at a point:
- (i) 20 N inclined at  $30^\circ$  from East to North,
  - (ii) 25 N towards North,
  - (iii) 30 N inclined at  $45^\circ$  from North to West,
  - (iv) 35 N inclined at  $40^\circ$  from West to South.

Find the magnitude and direction of the resultant force.

**Q. 2 Solve Any Two of the following.**

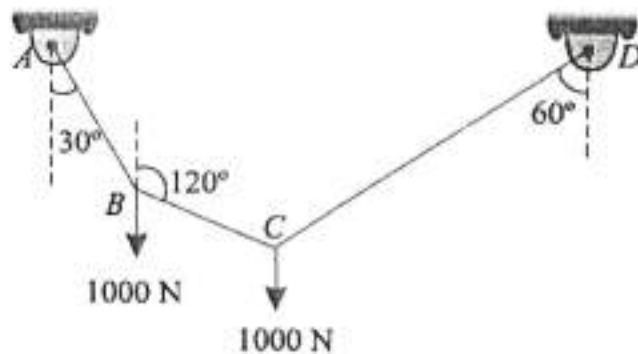
- A) The cylindrical rollers of weight 50 N each having radius 0.3 m are placed inside a cup having base width 1 m. Find reactions at points of contact A, B, C and D.

CO 1



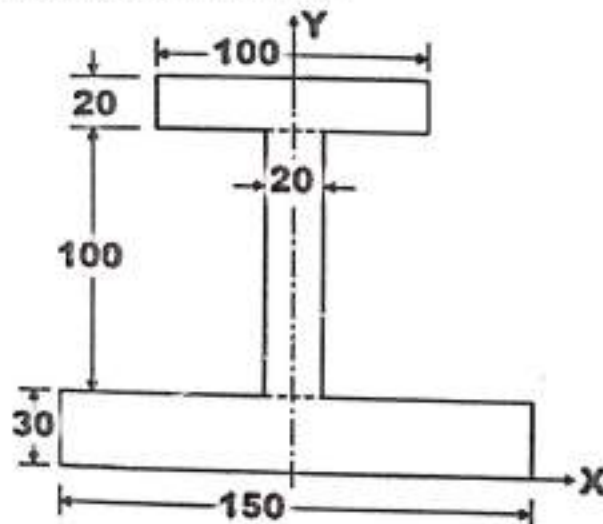
- B) A string ABCD, attached to fixed points A and D has two equal weights of 1000 N attached to it at B and C. The weights rest with the portions AB and CD inclined at angles. Find the tensions in the portions AB, BC and CD of the string, if the inclination of the portion BC with the vertical is  $120^\circ$ .

CO2



- C) Locate the centroid of the I-section shown in figure with respect to the axes shown. (All dimensions are in mm)

Application 06



**Q. 3 Solve Any Two of the following.**

- A) Define friction. What are the Coulomb's laws of dry friction?

Remember 06



**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE**

**Regular Summer Examination – 2023**

**Course: B. Tech.      Branch : Civil/Chemical/Petrochemical/Mechanical      Semester :II**

**Subject Code & Name: Computer Programming in C [BTES204]**

**Max Marks: 60**

**Date:**

**Duration: 3 Hr.**

**Instructions to the Students:**

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

(Level / Marks  
CO)

**Q. 1 Solve Any Two of the following.**

**[12]**

- A) Write note on Program Process Development.
- B) Write an algorithm and draw a flowchart for a program to print sum and average of 'n' natural numbers.
- C) Write a short note on the Tokens in C Language.

**Q.2 Solve Any Two of the following.**

**[12]**

- A) Write a program to find the maximum number from 3 numbers enter by user.
- B) Explain any three types of operators along with it's precedence and associativity.
- C) Write a program to create simple calculator to perform addition, subtraction, division, and multiplication operations.

**Q.3 Solve Any Two of the following.**

**[12]**

- A) Write a program to print area of square using function.
- B) Write a program to print factorial of a given number using while and also, write the program using do....while loop.
- C) Differentiate between while and do.....while loop.

**Q.4 Solve Any Two of the following.**

**[12]**

- A) Write a program to perform and to print the addition and subtraction of the two Matrices.
- B) Write a program to perform the following operations on the string (With and without using library function):

1. find length of string

2. copy

3. concatenation

4. reverse.



- C) Write syntax of following Concepts of C:  
1. Array                      2. Switch                      3. Function

**Q. 5 Solve Any Two of the following.**

- A) Write a program in C to create a structure of student with fields such as Student Name, Roll Number and Marks of two subjects as its members. Calculate average of two subjects. Read the details of 'n' students from user and then display the data in this format.

**Roll No. Name Sub1 Sub2 Total Average**

- B) Write a program in C to create a structure having named as Books consists of title, author, subject, book\_id as its members. Read the details of five books from user and then display the data entered by the user on Screen (Use array of structure).
- C) Define structure with suitable example. What is difference between structure and Union?

**\*\*\* End \*\*\***

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE**

**Regular & Supplementary Semester Examination – Summer 2023**

**Course: B. Tech.**

**Branch: Group B**

**Semester: II**

**Subject Code & Name: BTES205/BTES205E Energy and Environment Engg.**

**Max Marks: 60**

**Date: 21/7/2023**

**Duration: 3 Hrs.**

**Instructions to the Students:**

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

	(Level/CO)	Marks
<b>Q.1 Solve any two of the following.</b>		<b>12</b>
A) Explain the working of a Hydro electric power plant with neat diagram.	CO1	6
B) What is the nuclear chain reaction? Explain the importance of moderator and control rods in a nuclear reactor with respect to chain reaction	CO1	6
C) What are the fossil fuels used for generation of conventional power? Explain in detail Steam power plant.	CO1	6
<b>Q.2 Solve Any Two of the following.</b>		<b>12</b>
A) How the wind mills are classified? Sketch the diagram of HAWT, and explain the function of its main components.	CO2	6
B) What is Bio-mass? Write construction and working of bio-gas plant, with a neat diagram. Also write down the advantages of it.	CO2	6
C) Define solar energy. What is flat plate collector? Describe its components with suitable sketch.	CO2	6
<b>Q.3 Solve Any Two of the following.</b>		<b>12</b>
A) What do you mean by energy conservation? Explain the measures to be taken to reduce the energy conservation in domestic activities. List any four measures.	CO2	6
B) What do you understand by maximum energy efficiency in context with energy conservation principle? Discuss with a suitable example.	CO1	6
C) Write down methods of energy conservation in electric furnaces.	CO2	6
<b>Q.4 Solve Any Two of the following.</b>		<b>12</b>
A) Define Air Pollution. Write down the different classification of air pollution sources.	CO3	6
B) Explain briefly effect of air pollution on human being and vegetation.	CO1	6
C) What is radioactive pollution? What are its effects? How we can control Radioactive Pollution?	CO3	6
<b>Q.5 Solve any two of the following.</b>		<b>12</b>

- |  |     |   |
|--|-----|---|
| A) What are the main causes of water pollution? How can water pollution be controlled? | CO3 | 6 |
| B) Explain the following terms:<br>a. Thermal pollution<br>b. Acid rain                | CO3 | 6 |
| C) What are the various methods of safe disposal of solid wastes?                      | CO3 | 6 |

\*\*\* End \*\*\*





**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE**

**Summer Examination – 2023**

**Course: B. Tech.**

**Branch : FE All**

**Semester : II**

**Subject Code & Name: Engineering Mathematics-II (BTBS201)**

**Max Marks: 60**

**Date: 12-07-2023**

**Duration: 3 Hr.**

**Instructions to the Students:**

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

		(Level/CO)	Marks
<b>Q.1</b>	<b>Solve Any Two of the following.</b>		<b>12</b>
A)	If $\tan(A + iB) = x + iy$ then show that i) $\tan 2A = \frac{2x}{1-x^2-y^2}$ ii) $\tanh 2B = \frac{2y}{1+x^2+y^2}$	Understand (CO1)	6
B)	Show that the roots of $x^5 = 1$ are $1, \alpha, \alpha^2, \alpha^3, \alpha^4$ and hence prove that $(1 - \alpha)(1 - \alpha^2)(1 - \alpha^3)(1 - \alpha^4) = 5$	Understand (CO1)	6
C)	Prove that $\tan \left[ i \log \left( \frac{a-ib}{a+ib} \right) \right] = \frac{2ab}{a^2-b^2}$	Understand (CO1)	6
<b>Q.2</b>	<b>Solve Any Two of the following.</b>		<b>12</b>
A)	Solve $\frac{dy}{dx} + x \sin 2y = x^3 \cos^2 y$	Understand (CO2)	6
B)	Solve $y dx - x dy + \log x dx = 0$	Understand (CO2)	6
C)	A constant electromotive force $E$ volts is applied to a circuit containing a constant resistance $R$ ohm in series and a constant inductance $L$ Henries. If the initial current is zero, show that the current builds up to half its theoretical maximum in $\left( \frac{L}{R} \log 2 \right)$ seconds.	Apply (CO2)	6
<b>Q.3</b>	<b>Solve Any Two of the following.</b>		<b>12</b>
A)	Solve $\frac{d^2y}{dx^2} - 2 \frac{dy}{dx} + y = e^x + xe^x \cos x$	Understand (CO3)	6
B)	Solve $(D^2 + 2D + 1)y = e^{-x} \log x$ by method of variation of parameters	Understand (CO3)	6
C)	Solve $x^2 \frac{d^2y}{dx^2} - 2x \frac{dy}{dx} + 2y = x^2$	Understand (CO3)	6
<b>Q.4</b>	<b>Solve Any Two of the following.</b>		<b>12</b>
A)	Find the Fourier series of the function $f(x) = x$ in the interval $(0, 2\pi)$ .	Understand (CO4)	6
B)	Find the Fourier series of $f(x) = x^2$ in the interval $-\pi < x < \pi$ and hence show that $\frac{\pi^2}{6} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots$	Understand (CO4)	6

C)	<p>If <math>f(x) = \begin{cases} x &amp; , \quad 0 &lt; x &lt; \frac{\pi}{2} \\ \pi - x &amp; , \quad \frac{\pi}{2} &lt; x &lt; \pi \end{cases}</math> then find half range Fourier sine series</p> <p>Hence show that <math>f(x) = \frac{4}{\pi} \left( \sin x + \frac{\sin 3x}{3^2} + \frac{\sin 5x}{5^2} + \dots \right)</math></p>	Understand (CO4)	6
Q. 5	Solve Any Two of the following.		12
A)	<p>If <math>\vec{r} = xi + yj + zk</math> and <math>r =  \vec{r} </math> then Find <math>\nabla \cdot \vec{F}</math>,</p> <p>where <math>\vec{F} = \left(\frac{x}{r}\right)i + \left(\frac{y}{r}\right)j + \left(\frac{z}{r}\right)k</math></p>	Understand (CO5)	6
B)	Verify Green's theorem for $\oint_C (xy + y^2)dx + x^2dy$ where $C$ is bounded by $y = x$ and $y = x^2$	Understand (CO5)	6
C)	Verify the Stokes theorem for $\vec{F} = x^2i + xyj$ over the square in the plane $z = 0$ bounded by the lines $x = 0, x = a, y = 0$ and $y = a$	Apply (CO5)	6
	*** End ***		

