DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination –OCT 2018

Course: F.Y. B. Tech. Sem: I

Subject Name: Engineering Mathematics-I Subject Code:BTBS101

Max. Marks: 20 Date: 08.10.2018 Duration: 1Hr.

Instructions: 1. All question are compulsory.
2. Use of nonprogrammable calculator is allowed.
3. Figures to right indicate full marks.

Q1. Attempt the following. (6)

a. If the eigen values of matrix A are 2,3,5 then $|A| =$ ____.
i) 10 ii) 30 iii) 5 iv) none of these

b. If $u = \frac{x^3 + y^3}{x + y}$ then $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} =$ ___.
i) 0 ii) $3u$ iii) $2u$ iv) $\frac{u}{2}$

c. Cayley Hamilton theorem states that every square matrix A satisfies _____.
i) $|A - \lambda I| = 0$ ii) $|A| = 0$ iii) $[A - \lambda I] = 0$ iv) $|A| - |\lambda I| = 0$

d. For the system of non-homogeneous linear simultaneous equations $[A][X] = [B]$, there exist solution if _____
i) $\rho(A) = \rho(A|B)$ ii) $\rho(A) \neq \rho(A|B)$ iii) $\rho(A) = \rho(AB)$ iv) $\rho(A) = \rho(I)$

e. If $u = tan^{-1}\left(\frac{y}{x}\right)$, then $\frac{\partial u}{\partial x} =$ ____
i) $\frac{x}{x^2 + y^2}$ ii) $\frac{y}{x^2 + y^2}$ iii) $\frac{-x}{x^2 + y^2}$ iv) $\frac{-y}{x^2 + y^2}$

f. If $u = x^2y^3$ and $x = t^3$, $y = t^2$ then $\frac{du}{dt} =$ ____
i) $12\,t^{10}$ ii) $12\,t^{14}$ iii) $12\,t^{11}$ iv) $12\,t^6$

Q2. Attempt any **Two** of the following. (6)

(A) Reduce the matrix A to its normal form and hence find rank $A = \begin{bmatrix} 0 & 1 & 3 & 1 \\ 1 & 0 & 1 & 1 \\ -3 & 1 & 0 & -2 \\ -1 & 1 & 2 & 0 \end{bmatrix}$

(B) Test the consistency and solve if possible

$x + y + z = 4,\ 2x + 5y - 2z = 3,\ x + 7y - 7z = 5.$

(C) If $u = \log(x^3 + y^3 + z^3 - 3xyz)$ Prove that $\left[\frac{\partial}{\partial x} + \frac{\partial}{\partial x} + \frac{\partial}{\partial x}\right]^2 u = \frac{-9}{(x + y + z)^2}$.

Q3. Attempt the following. (8)

(A) Find the eigen values and eigen vector corresponding to smallest eigen value for the matrix $A = \begin{bmatrix} 1 & 1 & -2 \\ -1 & 2 & 1 \\ 0 & 1 & -1 \end{bmatrix}$.

(B) If $u = f(y - z,\ z - x, x - y)$. Prove that $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = 0$.

OR

(A) Using Cayley Hamilton Theorem, find A^{-1} for $A = \begin{bmatrix} 2 & 1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$

(B) If $u = \sin^{-1}\left(\frac{x + y}{\sqrt{x} + \sqrt{y}}\right)$.

Prove that $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2} = \frac{-\sin u \cos 2u}{4 \cos^3 u}$

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination – Oct 2018

Course: FY BTech Group B **Sem: I**

Subject Name: ENGINEERING MECHANICS **Subject Code: BTES103**

Max Marks: 20 **Date:-10/10/2018 Duration:- 1 Hr.**

Instructions to the Students:

1. **Assume appropriate data if not given**

Marks

Q. 1 **Multiple choice questions** **6**

1.. The resultant force of a distributed load is always equal to.....

A. twice the area under the loading curve
B. half the area under the loading curve
C. the area under the loading curve
D. one-fourth the area under the loading curve.

2. In Free Body diagram a cable is always Represented by ..... force.

A.SpringB.TensileC. Compressive D.Normal

3. A roller support has how many reactions?

A. None B. 1
C. 2 D. 3

4. A block weighing 250N is lying on horizontal table for Which coefficient of friction is 0.40.Angle of friction is.....

A. 20.80° B. 25°
C. 21.80° D. 28°

5. If joint is formed by three members such that two are collinear and no external force is acting then third non collinear member is Identified as....

A. Zero-force member B. One-force member
C. Two-force member D. Three-force member

6.The Relation used by Parallel axis theorem is .....

A. $I = I_G + A r^2$ B. $I = Ixx + Iyy$
C. $Izz = Ixx + Iyy$ D. $I = I_G + Ar$

Q.2 **Solve Any Two of the following.** **3 X 2**

(A) **State and Prove Law of parallelogram of forces.**

(B) **Locate the centroid of the following L-section as shown in fig-1 .having flange 10 mm x 80mm, and web 10 mm x 120 mm.**

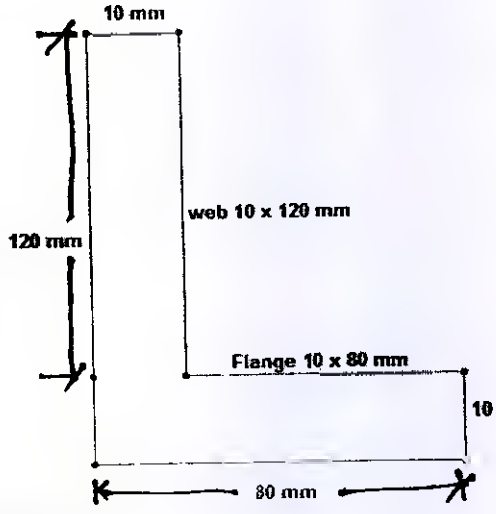


Fig -1

(C) **State the laws of Friction**

Q. 3 Solve Any One of the following. **8 X 1**

(A)

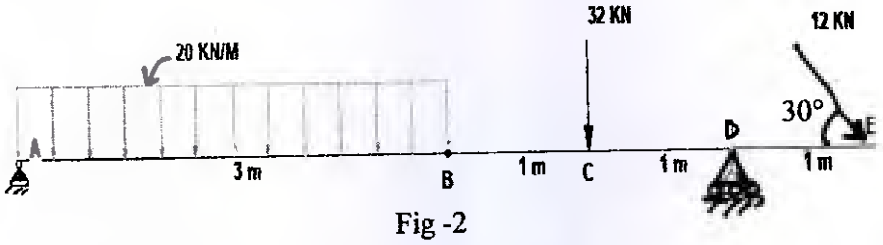
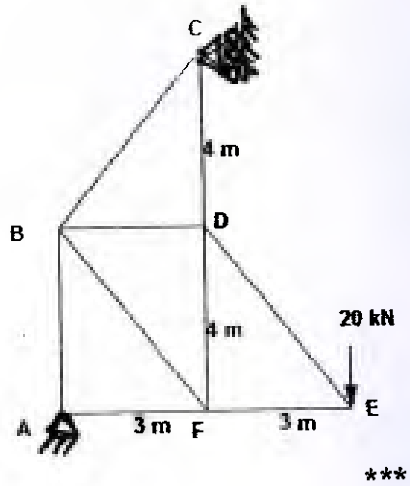


Fig -2

A Beam is loaded by hinge support at A And roller support at D. Calculate reactions at A & D Refer fig-2

(B)



Truss is loaded at hinge support at A & Roller at C Analyse the truss as shown in Fig-3

Fig -3

*** **End** ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination – **Oct 2018**

Course: B. Tech **Sem:** I

Subject Name: Computer Programming In C **Subject Code:** BTES104

Max Marks: 20 **Date:-** **Duration:-** 1 Hr.

Instructions to the Students:

1. Check that you have received a correct Question paper.
2. Assume suitable data if necessary and mention it clearly

Q.1. Fill in the blanks, attempt any **six Questions** (1*6 = 6 Marks)

1. What is output of following code?

```
#include <stdio.h>
int main()
{
    int i = 5;
    i = i / 3;
    printf("%d\n", i);
    return 0;
}
```

(a) Syntax error (b) 1 (c) 3 (d) 0.6

2. Which of the following special symbol is allowed in variable name?
   (a) * (b) | (c) – (Hyphen) (d) _ (Underscore)

3. Size of short integer and long integer can be verified using the sizeof operator
   (a) true (b) false

4. Which bitwise operator is suitable for turning OFF a particular bit in a number?
   (a) && operator (b) & operator (c) || operator (d) | operator

5. Which of the following is the correct order of evaluation for the expression given below?
   t = 5+2 *3/3 – 6%2
   (a) * / % + - = (b) = * / % + - (c) / * % - + = (d) * % / - + =

6. Which of the following method are accepted for assignment?
   (a) 5 = a = b = c = d; (b) a = b = c = d = 5;
   (c) a = b = 5 = c = d; (d) None of the mentioned

7. Preprocessor command is denoted by _____.
   (a) * (b) & (c) # (d) //

[P.T.O]

Q. 2. Attempt any **two** of the following (2*3 =6 Marks)

A. Explain increment and decrement operators with suitable example.

B. Name and describe various data types in C.

C. Explain ternary operator with suitable example.

Q.3. Attempt any **one** of the following (1* 8 = 8 Marks)

A. Write an algorithm, draw flowchart and write a program to read two numbers and perform arithmetic operations on them.

B. Explain structure of C program with suitable example.

END

	DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE **Mid Semester Examination – Oct. 2018** **Course: B. Tech in Civil/Mechanical/Chemical Engineering Sem.: I** **Subject Name: Energy and Environment Engineering Subject Code: BTES105** **Max Marks:20 Date:- 12/10/2018 Duration:- 1 Hr.**	
	Instructions to the Students: 1. Please check whether you have got the right question paper 2. Clearly mention the main question number along with the sub questions. 3. Question No. 1 is compulsory. 4. Figures carries marks	
		Marks
Q. 1	**Select the right choice from the given answers**	**6**
	1. The overall efficiency of the Thermal power plant is ---------- a) 22-27% b) 28-35% c) 35-40% d) 40-45%	
	2. Most commonly used moderator in Nuclear power plant is ---------- a) Heavy water b) Concrete and bricks c) Graphite and concrete d) Graphite	
	3. The function of surge tank is ---------- a) To supply water at constant pressure b) To produce surges in the pipe line c) To relieve water hammer pressures in the penstock pipe d) All of the above	
	4. The radiation in the sunlight that gives us the feeling of hotness is ----------. a) Visible radiation b) infra-red c) red d) ultra-violet	
	5. Which of these is not a renewable source of energy? a) The sun b) Natural gas c) Wind d) Ocean tidal energy	
	6. When animals and plants are rotten in absence of air, there produces a gas called, a) oxygen b) carbon dioxide c) bio gas d) methane	
Q.2	**Solve Any Two of the following.**	**3X2**
(A)	Explain the working of simple gas turbine power plant using neat sketch and labels.	
(B)	How solar energy converted to electrical energy? What are the applications of solar energy?	
(C)	What is fuel-cell? Explain any one type of fuel-cell in detail.	

Q. 3	**Solve Any One of the following.**	**8**
(A)	Explain how the nuclear power plant works. Label all the components of the plant using neat sketch.	
(B)	Draw and explain schematic arrangement of open loop and closed loop Magneto Hydro Dynamic (MHD) generator.	
	***** End *****	

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Mid semester Examination- October-2018

Branch: Group A(Mechanical, Chemical and Civil) **Sem.:- I**
Subject: Engineering Physics (BTBS102) **Marks:20**
Date: 09/10/2018 **Time: 1 Hrs**

Instructions:- **1. Do not write anything on question paper.**
2. Neat and labeled diagram must be drawn wherever necessary.
3. Use of non programmable calculator is allowed.
4. Figures to the right indicate full marks.
5. Assume suitable data if required.

Q.1. Attempt following questions **(6 Marks)**

a) The sound is heard in organ pipe. The phenomenon used here is
i. oscillatory motion ii. Resonance
iii. periodic motion iv. Circular motion

b) In a magnetostriction effect , material of rod placed in a steady magnetic field is,
i. ferromagnetic ii. ferrimagnetic iii. diamagnetic iv. paramagnetic

c) What is the need to achieve population inversion?
i. to excite most of the atoms ii. To bring most of the atom to ground state
iii. to achieve stable condition iv. To reduce the time of production of laser.

d) Constructive interference appears when two waves are
i. out of phase ii. In phase
iii. having zero amplitude iv. having unequal wavelength

e) Huygens wave theory could not explain_____
i. Polarizaton ii. Compton effect
iii. Photoelectric effect iv. All of above.

f) Polarizability is defined as the
i. product of dipole moment and electric field
ii. ratio of dipole moment to electric field
iii. ratio of electric field to dipole moment
iv. product of dielectric constant and dipole moment

Q. 2. Attempt any TWO of the following **(6 Marks)**

i) Describe Huygen's theory of double refraction and explain e-ray and o-ray.
ii) How dielectric polarization changes with frequency?
iii)Calculate the length of iron rod which can be use to produce ultrasonic wave of frequency 20KHz. Density of iron is 7.23×10^3 kg/m^3 and Youngs modulus is 11.6×10^{10} N/m^2

Q.3. Attempt any one of the following **(8 Marks)**

i.) What is damped vibration? Obtain the differential equation of damped vibration and find its solution. Discuss the various damping conditions.

ii.)Explain the theory of appearance of Newton's rings and hence derive an equation for diameter of n^{th} dark and bright ring.

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination – Oct 2018

Course: First Year B. Tech(Group- B CSE,ECT,IT,EEP **Sem: I**

Subject Name: Engineering Chemistry **Subject Code: BTBS 102**

Max Marks: 20 Date:-09/10/2018 **Duration:- 1 Hr.**

Instructions to the Students:

1. Do not write anything on question paper
2. Neat and labeled diagram must be drawn whenever necessary.
3. Use of non programmable calculator is allowed.
4. Figures to the right indicate full marks.
5. Assume suitable data if required

Q. 1 Answer the following

1. Phase rule is applicable for
   A. Homogenous system B. Reversible system C. Irreversible system D. Heterogeneous system
2. Hardness of water is conventionally expressed in terms of equivalent amount of
   A. H_2CO_3 B. $MgCO_3$ C. $CaCO_3$ D. Na_2CO_3
3. What is the degree of freedom of a system with 2 phases and 1 component?
   A. 1 B. 2 C. 3 D. 4
4. What is the name of the phase transition that occurs when a solid is converted directly into a gas (without going through the liquid phase)?
   A. Melting B. Boiling C. Condensing D. Sublimation
5. Solution used for regeneration of exhausted Zeolite is
   A. HCl B. NaOH C. NaCl D. KCl
6. The residual hardness in ion exchange process is
   A. 0-2 ppm B. 5-10 ppm C. 10-15 ppm D. 20-30 ppm

Q.2 Solve Any Two of the following.

(A) Differentiate between temporary hardness and permanent hardness.

(B) What is a reduced phase rule? When is it applied?

(C) Write a short note on dissolved oxygen (DO).

Q. 3 Solve Any One of the following.

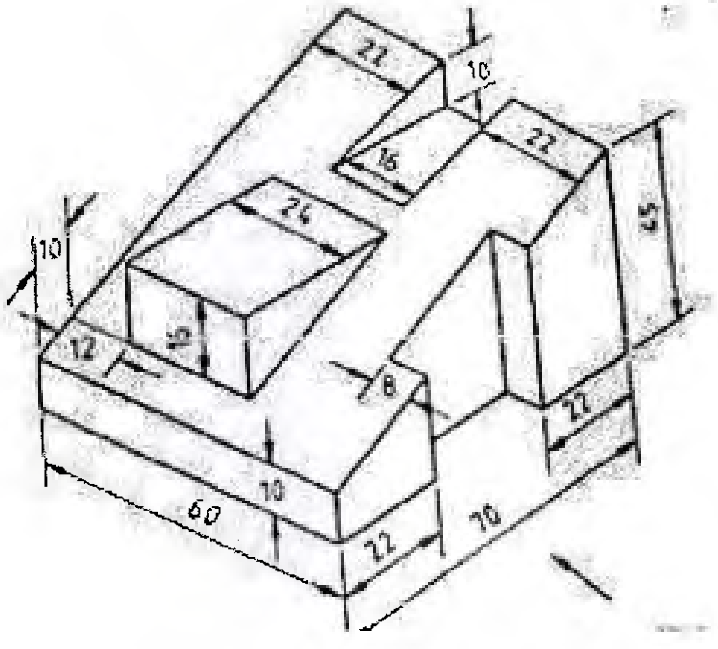
(A) Define temporary and permanent hardness of water. How hardness of water is removed by using zeolite process? Explain with suitable diagram.

(B) State Gibb's phase rule. Draw a neat labeled phase diagram of sulphur system and explain areas, curves and triple point in it.

*** End ***

B

	DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE **Mid Semester Examination – Oct 2018** **Course: F.Y.B. Tech** **Sem: I** **Subject Name: Engineering Graphics** **Subject Code: ME104** **Max Marks: 20** **Date:-** **Duration:- 1 Hr.**		
	Instructions to the Students: **1. Assume suitable data if necessary and state it clearly.** **2. Figures to the right indicate full marks** **3. Retain all construction lines**		
			Marks
Q. 1	**Solve *any two* out of the following:**		**5x2=10**
	1. Use inscribe circle method to draw a regular pentagon if length of side is 50mm.		
	2. Draw a regular hexagon having side length 60 mm by using arc method of drawing.		
	3. Explain various types of lines with their illustrations, thickness and applications.		
Q.2	**Draw front view, top view and left hand side view in the direction of arrow shownin the figure below:-(Use first angle method of projection)**		**10**



DR.BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE.

Mid Semester Examination- Oct 2018

Course: First Year B.Tech **Semester: I**

Subject: Communication skills **Subject Code: BTHM104**

Max Marks: 20 **Date:** **Duration: 1 hour**

Q.1- Choose the correct option and fill the blanks: **(6 marks)**

1- **Semantic barriers are also called as ---------- barriers.**

A- Kinesics, B- Status, C- mechanical, D- Language.

2- **Know your ---------- for effective communication.**

A- Channel, B- Audience, C- Feedback, D- Speaker

3- **A message expressed by using gestures is called ----------** Communication.

A- Verbal , B- Intrapersonal, C-Non –Verbal , D- Group

4- **Leadership skills are learnt in ----------.**

A- Group Discussion, B-Elocution, C- Extempore, D- Intrapersonal communication

5- **A barrier refers to ----------.**

A- A pathway, B- Feedback, C- Communication, D- An obstacle.

6- **Listening is said to be ----------**

A- Hearing, B- A Negative Act, C- An Active Process, D- Semantic.

Q2- Attempt any two of the following: **(6 marks)**

1- State the functions of Communication.
2- State the advantages of listening.
3- Explain the process of communication with flowchart.

Q3- Attempt any one of the following: **(8marks)**

1- What is Group Discussion? State its types with examples.
2- Define communication. Write advantages and Disadvantages of written communication **(3 points each)**