AR16

CODE: 16BS1002   SET-2
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech II Semester Regular Examinations, June-2017
ENGINEERING MATHEMATICS – II
(Common to all branches)

Time: 3 Hours   **Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered at one place

UNIT-I

1 a) Find a real root of $x^3 - x - 1 = 0$ using Bisection method correct to three decimal
      Places.   (7 M)
  b) Use the method of false position to find the fourth root of 32 correct to three
      decimal places.   (7 M)

(OR)

2.a) Prove that $hD = \log(1 + \Delta) = -\log(1 - \nabla) = \sinh^{-1}(\mu\delta)$ (7 M)

  b) The Table gives distances in nautical miles of the visible horizon for the given heights
     in feet above the earth's surface.   (7 M)

X= height	100	150	200	250	300	350	400
Y =distance	10.63	13.30	15.04	16.81	18.42	19.90	21.27

Find the value of y when x = 410 ft.

UNIT-II

3 a) A solid revaluation is formed by rotating about x-axis, the area between the x-axis, the lines
      x = 0 and x = 1 and a curve through the points with following co-ordinates.   (7 M)

x	0.00	0.25	0.50	0.75	1.00
y	1.0000	0.9896	0.9589	0.9089	0.8415

Estimate the volume = $\int_0^1 y\, dx$ of the solid by using Simpsons rule.

3 b) Given that   (7 M)

X	1.00	1.05	1.10	1.15	1.20	1.25	1.30
Y	1.0000	1.0247	1.0488	1.0723	1.0954	1.1180	1.1401

Find $\frac{dy}{dx}$ at x = 1.00.

(OR)

4 a) Find by Taylor series method the value of y at x = 0.1 and x = 0.2 to five places of decimals
from $\frac{dy}{dx} = x^2 y - 1$, y(0) = 1.   (7 M)
  b) Apply R – K method of fourth order to find an approximate value of y when x = 0.2 given
that $\frac{dy}{dx} = x + y$ and y = 1 when x = 0.   (7 M)

UNIT-III

5.a) Evaluate $L\left\{e^{-t}\int_0^t \frac{sint}{t}\, dt\right\}$. (7 M)

b) Evaluate $L\left\{e^{4t}\sin(2t)\cos(t)\right\}$. (7 M)

(OR)

6.a) Evaluate $L^{-1}\left\{\frac{1}{s\,(s+2)^2}\right\}$. (7 M)

b) Solve $\frac{d^2 x}{dt^2} + 9\,x = \cos(2t)$ if x (0)= 1 , x($\pi/2$) $= -1$. (7 M)

UNIT-IV

7 Expand f(x) = $\begin{cases} \frac{1}{4} - x\,, if\ 0 < x < \frac{1}{2} \\ x - \frac{3}{4}\,, if\ \frac{1}{2} < x < 1 \end{cases}$ as the Fourier sine series . (14 M)

(OR)

8 Find the Fourier series for the function f(t) = $\begin{cases} -1\,, if\ -\pi < t < -\pi/2 \\ 0\,, if\ -\frac{\pi}{2} < t < \frac{\pi}{2} \\ 1,\ if\ \ \pi/2 < t < \pi \end{cases}$ (14 M)

UNIT-V

9 a) Form the p.d.e by eliminating the arbitrary functions f, g from z = x f(ax+by) + g(ax+by). (7 M)

b) Solve the equation px(x +y) = qy (x + y) - (2x + 2y + z) (x − y). (7 M)

(OR)

10 A bar AB of length 10 cm has its ends at $30^{\circ}\ and\ 100^{\circ}$ temperatures respectively. Until steady-state condition is reached. Then the temperature at A lowered to 20° and that B at to 40° and these temperatures are maintained. Find the subsequent temperature distribution in the bar. (14 M)

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CODE: 16CE1001   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech II Semester Regular Examinations, June-2017

BUILDING MATERIALS AND CONSTRUCTION
(Civil Engineering Branch)

Time: 3 Hours   Max Marks: 70

Answer ONE Question from each UNIT
All Questions Carry Equal Marks
All parts of a Question must be answered in one place only

UNIT-I

1. a) Explain various constituents in brick earth with their importance [6 M]
    b) Explain the manufacturing process of cement [8 M]

(OR)

2. a) Define quarrying and describe various tools for blasting with neat sketches [6 M]
    b) Describe briefly about the manufacturing process of common tiles [8 M]

UNIT-II

3. a) Describe various functions of sand in mortar [6 M]
    b) Explain the methods of polymerization [8 M]

(OR)

4. a) Explain slump test to measure workability of concrete [6 M]
    b) Describe briefly about manufacturing process of glass [8 M]

UNIT-III

5. a) Describe English bond and Flemish bond with neat sketches [6 M]
    b) Explain various damp proofing materials [8 M]

(OR)

6. a) Describe various types of stone masonry [6 M]
    b) Explain briefly various partition walls [8 M]

UNIT-IV

7. a) Describe various factors that will affect the selection of a flooring material [6 M]
    b) Explain various roof coverings for pitched roofs [8 M]

(OR)

8. a) What are the points to be considered while locating doors and windows [6 M]
    b) Explain various requirements of a good stair [8 M]

UNIT-V

9. a) Explain white washing and colour washing [6 M]
    b) Describe various under pinning methods with neat sketches [8 M]

(OR)

10. a) Describe various anti termite treatment methods [6 M]
    b) Explain the process of painting on new wood work and old wood work [8 M]

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CODE: 16ME1003   SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech II Semester Regular Examinations, June-2017
ENGINEERING MECHANICS (STATICS)
(Mechanical Engineering Branch)

Time: 3 Hours   Max Marks: 70M

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

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UNIT-I

1. a   State and prove to parallelogram law of forces   [7M]
   b   A light string ABCDE whose extremity A is fixed, has weights W_1 and W_2 [7M]
        attached to it at B and C. It passes round a small smooth peg at D carrying a weight
        of 300 N at the free end E as shown in Fig. 1
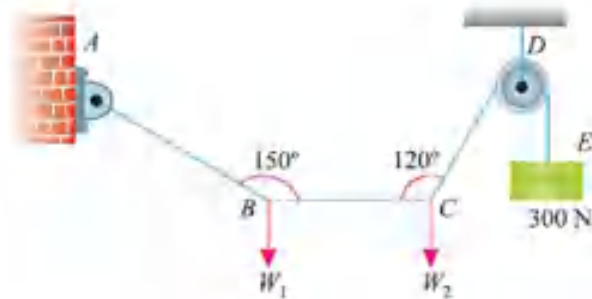
Fig.1

(OR)

2. a   State and Prove Lami's Theorem   5M
   b   Two cylinders P and Q rest in a channel as shown in Fig 2. The cylinder P has   9M
        diameter of 100 mm and weighs 200 N, whereas the cylinder Q has diameter of
        180 mm and weighs 500 N .If the bottom width of the box is 180 mm, with one
        side vertical and the other inclined at 60°, determine the pressures at all the four
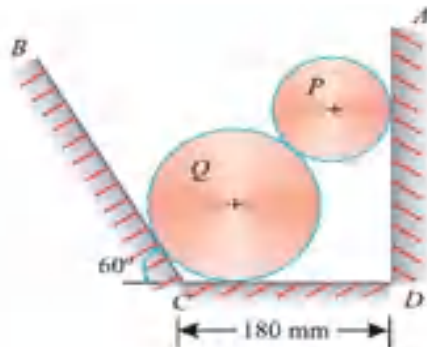   points of contact.

Fig. 2

UNIT-II

3. a   State and Prove Varignon's Theorem   5M

    b   Four forces equal to P, 2P, 3P and 4P are respectively acting along the four sides of   9M
square ABCD taken in order as shown in Fig.3. Find the magnitude, direction and
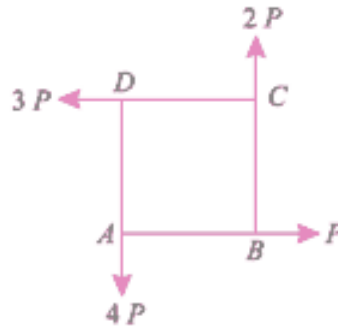position of the resultant force.

Fig. 3

(OR)

4. a   State the laws of friction   5M

    b   Explain the following   9M
        i)   Angle of friction ii) Angle of repose iii) cone of friction

UNIT-III

5. a   Find the centroid of an unequal angle section 100 mm × 80 mm × 20 mm as shown   7M
in Fig. 5.
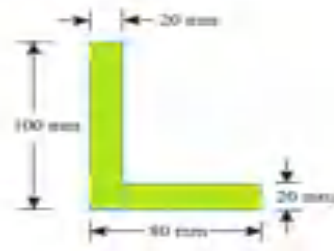
Fig. 4

    b   A semicircle of 90 mm radius is cut out from a trapezium as shown in Fig.6. Find   7M
the position of the centre of gravity of the figure.
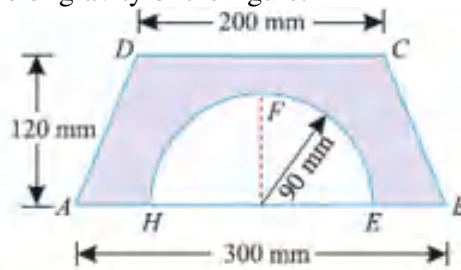
Fig. 5

6. a   State and Prove Parallel axis Theorem   5M
    b   Fig.7 shows the cross-section of a cast iron beam. Determine the moments of   9M
        inertia of the section about horizontal and vertical axes passing through the
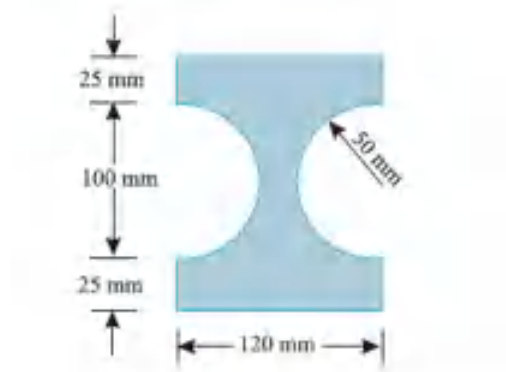   centroid of the section

25 mm

100 mm

50 mm

25 mm

120 mm

Fig. 6

UNIT-IV

7.   Determine the axial forces induced in the members 1, 2 & 3 for the truss as shown   14M
        in Figure - 7
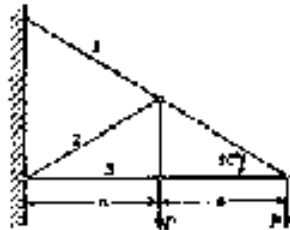
Fig. 7

(OR)

8. a   State the assumptions made in the analysis of Method of Joints.   4M
    b   The truss ABC shown in Fig.8 has a span of 5 metres. It is carrying a load of 10   10M
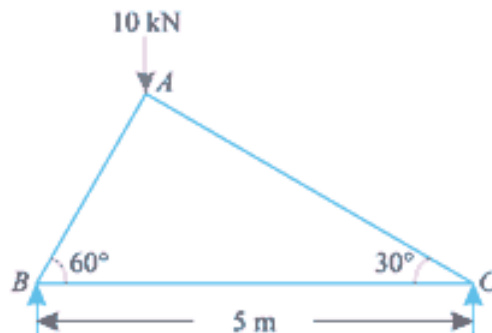   kN at its apex. Find the forces in the members AB, AC and BC.

10 kN

A

60°   30°

B   C

5 m

Fig. 8

9. a   Two beams AE and BD are supported on rollers at B and C as shown in Fig.9.   7M
    Determine the reactions at the rollers B and C, using the method of virtual work.
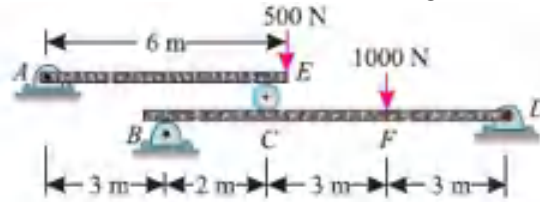

Fig. 9

b   A uniform ladder, 5 metres long and weighing 200 N, rests on a smooth floor at A   7M
and against a smooth wall at B as shown in Fig. 10. Using the method of virtual
work, determine the force P required to stop the motion of the bar..
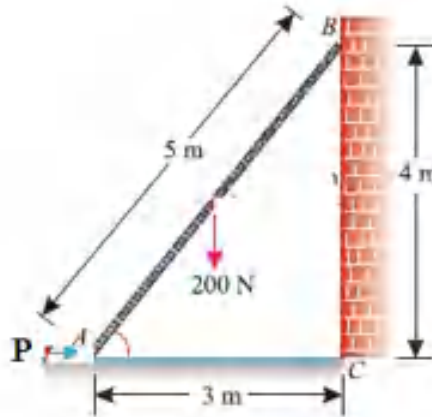

Fig. 10

(OR)

10. a   A simply supported beam AB of span 5 m is loaded as shown in Fig.11. Using the   7M
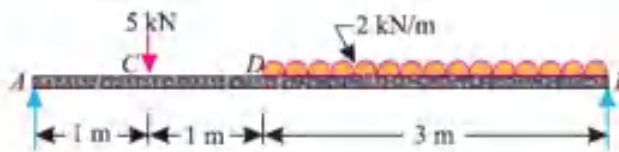   principle of virtual work, find the reactions at A and B.

Fig. 11

b   A weight (W) of 5 kN is raised by a system of pulleys as shown in Fig.12 Using   7M
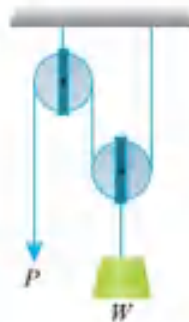the method of virtual work, find the force P, which can hold the weight in
equilibrium.

Fig. 12

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech II Semester Regular Examinations, June-2017
Electrical and Electronics Engineering
(CSE Branch)

Time: 3 hours **Max Marks: 70**

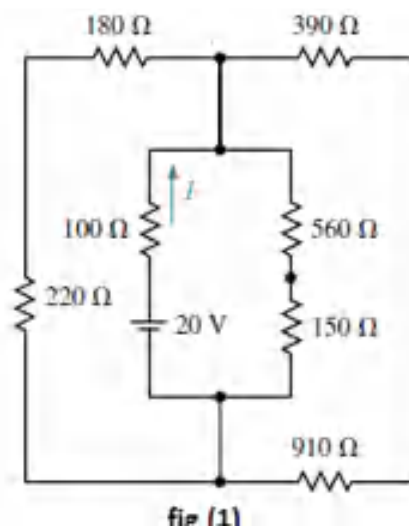Answer One Question from each unit
All Question carry Equal Marks
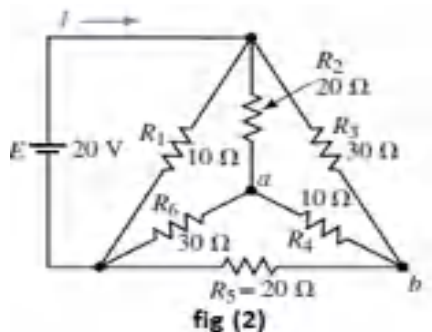All parts of the Questions must be answer in one place only

UNIT I

1. a) State and explain Kirchhoff's laws with example? 6M
   b) Find the current 'I' drawn from circuit shown in fig (1) 8M

fig (1)

(OR)

2. a) State and explain the Ohm's law ? 6M
   b) Find the current drawn from the battery E in the below circuit shown in Fig (2) ? 8M

fig (2)

UNIT II

3. a) Describe the classification of DC generator and write their voltage and current equations? 8M

  b) Explain OCC characteristics of DC shunt generator and how to find critical field resistance and critical speed of DC motor? 6M

(OR)

4. a) Explain the principle of operation of DC generator and derive the EMF equation? 8M

  b) Explain the different speed control methods of dc shunt motor? 6M

UNIT III

5. a) Explain the principle operation of transformer? 7M

  b) Derive the EMF equation of Single phase Transformer? 7M

(OR)

6. a) Explain the OC and SC tests of a Transformer to find the efficiency and regulation ? 8M

  b) Explain how the rotating magnetic field is formed in 3-Ø induction motor? 6M

UNIT IV

7. a) Explain the construction of alternator with neat diagram? 7M

  b) Derive EMF equation of alternator? 7M

(OR)

8. a) Explain classification of measuring instruments? 6M

  b) Explain the operation of moving iron instrument? 8M

UNIT IV

9. a) Explain the working of transistor and write the symbols of PNP and NPN Transistor? 7M

  b) Explain the operation of half wave rectifier? 7M

(OR)

10. a) Explain the working of transistor in common emitter configuration? 6M

  b) A half wave rectifier is used to supply 50V to 600Ω. The diode has a resistance of 15Ω. Find the ac voltage required? 8M

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