



Reg. No. :

Name :

**Combined I and II Semester B.Tech. (Reg./Sup./Imp.) – including Part Time
Degree Examination, April 2011
(2007 Admn.)**

2K6 EN 101 : ENGINEERING MATHEMATICS – I

Time: 3 Hours

Max. Marks : 100

- I. a) Solve $e^x (y - 1)dx + 2(e^x + 4) dy = 0$.
- b) Find the orthogonal trajectory of the family of parabolas $y^2 = 4ax$.
- c) Obtain the L {sin kt} by the defn. of Laplace transform.
- d) Obtain the inverse Laplace transform of $\log\left(\frac{1-s^2}{s^2}\right)$.
- e) If $u = f(x + at) + g(x - at)$, prove that $u_{ff} = a^2 u_{xx}$.
- f) Find $\text{curl}(\text{curl } \vec{A})$ given that $\vec{A} = xyi + y^2zj + z^2yk$.
- g) Find the Fourier series of $f(x) = x$ in $-1 \leq x \leq 1$.
- h) Expand $f(x) = \cos x$ in half range sine series over $(0, \pi)$. (8×5=40)
- II. a) Solve $(2x - y)dx + (4x + y - 6)dy = 0$. 8
- b) Solve $(D - 2)^2 y = 8(e^{2x} + \sin 2x + x^2)$. 7
- OR
- a) Solve $(1 + y^2)dx = (\tan^{-1}y - x)dy$. 7
- b) Solve by the method of variation of parameters, $y'' - 2y' + y = e^x \log x$. 8
- III. a) If $L\{f(t)\} = F(s)$, then for a +ve integer n , $L\{t^n f(t)\} = (-1)^n \frac{d^n}{ds^n}(F(s))$. 7
- b) Obtain the inverse Laplace transform of 8
- i) $\log\left(\frac{s+a}{s+b}\right)$ ii) $\tan^{-1}\left(\frac{2}{s^2}\right)$.
- OR

P.T.O.



a) Find the Laplace transforms of

i) $\frac{1-e^t}{t}$

ii) $e^{3t} \sin 4t$

7

b) State and prove convolution theorem.

8

IV. a) State and prove Euler's theorem.

7

b) If $\vec{r} = xi + yj + zk$ and $r = |\vec{r}|$, prove that

i) $\nabla \cdot \vec{r} = 3$

ii) $\nabla r^n = nr^{n-2} \vec{r}$

iii) $\nabla^2 r^w = n(n+1)r^{n-2}$

8

OR

a) Prove that $\nabla \cdot (\vec{A} \times \vec{B}) = \vec{B} \cdot (\nabla \times \vec{A}) - \vec{A} \cdot (\nabla \times \vec{B})$.

6

b) i) If $u = F(x - y, y - z, z - x)$, prove that $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = 0$.

4

ii) The radius of a sphere is found to be 10 cms with possible error of 0.02 cm. What is the relative error in computing the volume?

5

V. a) Expand $f(x) = 2x - x^2$ as a Fourier series in the interval $(0, 3)$.

9

b) Find the Fourier cosine series of $f(x)$ where

$$f(x) = kx, \quad 0 \leq x \leq \frac{l}{2}$$

$$= k(l - x), \quad \frac{l}{2} < x \leq l$$

6

OR

a) Obtain the half range cosine series for $f(x) = \sin\left(\frac{m\pi x}{l}\right)$ in $(0, l)$.

9

b) Give the following tabular values; obtain the Fourier series neglecting terms higher than first harmonics.

x°	0°	60°	120°	180°	240°	300°
y	7.9	7.2	3.6	0.5	0.9	6.8

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**Combined I and II Semester B.Tech. (Regular/Supplementary/Improvement
including Part Time) Degree Examination, April 2011
(2007 Admn.)
2K6KN 102 : ENGINEERING PHYSICS**

Time: 3 Hours

Max. Marks: 100

*Instructions : i) Answer all questions.
ii) Assume suitable data that are not given.*

- I. a) How are Newton's rings formed ? Why are they circular ? 5
- b) Explain the working of a quarter wave plate. 5
- c) Write in brief a note on uncertainty principle. 5
- d) Explain the basic principle of NMR. 5
- e) In brief explain signal distortion in an optical fiber. 5
- f) What are X rays ? Discuss their properties. 5
- g) What are intrinsic semiconductors ? Explain how doping affects conductivity in a semiconductor. 5
- h) Explain Josephson effect in a superconductor. 5
- II. a) i) Explain production and detection of circularly and elliptically polarised light. 10
- ii) The diameter of 10th dark ring in a Newton's ring system viewed normally by reflected light of wavelength 5.9×10^{-5} cm is 0.5 cm. Calculate the thickness of airfilm and the radius of curvature of the lens. 5

OR

- b) i) Explain how optical flatness of a surface is tested by forming wedge shaped film. 10
- ii) A length of 25 cm of a solution, containing 50 gm of solute/lit causes a rotation of the plane of polarisation of light by 5° . Find the rotation of plane of polarisation by a length of 75 cm of a solution containing 100 gm/lit of solute. 5

P.T.O.



- III. a) i) Set up Schrodinger's time dependent wave equation for a particle in one dimensional potential well. 10
- ii) A particle is moving in one dimensional potential box of width 50\AA . Calculate the probability of finding the particle within an interval of 10\AA at the centre of the box when it is in its state of least energy. 5

OR

- b) i) By assuming time independent Schrodinger's wave equation, find the solution for a particle in one dimensional potential well of infinite height. 10
- ii) The position and momentum of $1\text{ KeV } e^-s$ are simultaneously determined and if its position is located within 1\AA what is % uncertainty in momentum. 5
- IV. a) i) With energy level diagram explain the construction and working of He-Ne laser. 10
- ii) An optical fiber of refractive index 1.45 is to be clad with another glass to ensure total internal reflection that will contain light travelling within 5° of the fiber axis. What maximum index of refraction is allowed for cladding? 5

OR

- b) i) With energy band diagram explain the working of CO_2 laser. 10
- ii) A pulsed laser emits photons of wavelength 78 nm with 20 mW average power/pulse. Calculate the no. of photons contained in each pulse if the pulse duration is 10 ns . 5
- V. a) i) Explain the term thermal velocity and drift velocity. Obtain the relation between conductivity and relaxation time. 10
- ii) The Hall co-efficient of a specimen doped silicon is found to be $3.66 \times 10^{-4}\text{ m}^3/\text{C}$. The resistivity of the specimen is $8.93 \times 10^{-3}\text{ um}$. Find the mobility and density of the charge carrier assuming single carrier concentration. 5

OR

- b) i) Explain how conductivity of superconductors behave with temperature in compared to normal conductors. Explain BCS theory of superconductors. 10
- ii) Write a note on extrinsic semiconductors. 5



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**Combined I and II Semester B.Tech. (Reg./Sup./Imp. including Part Time)
Degree Examination, April 2011
(2007 Admn.)
2K6 EN 103 : ENGG. CHEMISTRY**

Time: 3 Hours

Max. Marks: 100

Instructions : 1) Answer all questions.
2) Draw neat sketches wherever necessary.

- I. a) Describe the technique of solution polycondensation. 5
 b) Explain any one type of mechanism of lubrication. 5
 c) What are concentration cells ? Derive the Nernst equation for concentration cells. 5
 d) Explain the construction, working of $H_2 - O_2$ fuel cell. 5
 e) Explain differential aeration corrosion with suitable example. 5
 f) What are inorganic coatings ? Explain anodization of aluminium. 5
 g) Define cracking. Explain fluidized bed catalytic cracking process. 5
 h) What is acid-rain ? Give the harmful effects of acid rain. 5
- II. a) i) Discuss the relationship between structure and following properties of a polymer. 6
 1) Crystallinity
 2) Plastic deformation.
 ii) Explain the synthesis and applications of plexi glass. 3
 iii) Write a note on synthetic lubricants. 6
- OR
- b) i) Explain the free radical mechanism of addition polymerization taking ethylene as an example. 6
 ii) What are the deficiencies of natural rubber ? 3
 iii) Explain the synthesis and applications of the following :
 1) Neoprene 2) Bakelite. 6

P.T.O.

- III. a) i) Define ion selective electrodes. Explain the experimental method of determination of pH using glass electrode. 5
- ii) Explain the construction, working and applications of Ni – Cd battery. 6
- iii) Derive the Henderson equation when a weak acid ionizes as
- $$HA \rightleftharpoons H^+ + A^-$$
- OR 4
- b) i) Derive the Nernst equation for electrode potential. 4
- ii) Explain the construction, working and applications of Pb-acid battery. 6
- iii) Write a note on Bronsted-Lowry concept of acid and bases. 5
- IV. a) i) Define corrosion. Explain the electrochemical theory of corrosion taking iron as an example. 7
- ii) Explain the electroless plating of copper on PCB. 8
- OR
- b) i) Explain the following factors which affects the rate of corrosion,
- a) Electrode potential b) Nature of the corrosion product. 6
- ii) Differentiate between electroplating and electroless plating. 4
- iii) Define Varnish. Explain the two types of varnishes. 5
- V. a) i) Define knocking. Explain the mechanism of knocking. 6
- ii) Explain the sources and harmful effects of the following air pollut.....
- a) CO b) SO₂ c) CO₂. 9
- OR
- b) i) Explain the experimental determination of calorific value of a solid fuel by Bomb calorimetric method. 7
- ii) Explain the activated sludge method of treatment of domestic sewage. 4
- iii) Write short notes on reforming. 4



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**Combined I and II Semester B.Tech. (Regular/Supplementary/Improvement
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2K6EN 104 : ENGINEERING MECHANICS

Time: 3 Hours

Max. Marks: 100

Instructions : 1) Answer all questions.

2) Missing data assumed suitably.

1. a) Mention different types of force systems.
 - b) Define force. What are its effects ?
 - c) Define and explain angle of friction and angle of repose with a help of neat figure.
 - d) Explain moment of inertia and polar moment of inertia.
 - e) With the help of neat figure: Mention different types of supports.
 - f) List the basic assumptions made in the analysis of pin jointed truss.
 - g) State and explain D'Alembert's principle as applied to motion of rigid bodies.
 - h) What do you mean by dynamic equilibrium ? On which principle it is based ? **(8×5=40)**
2. a) The resultant of a three forces is a 500 N force acting along x axis to the right. Find the force P and angle θ . (Figure 2. a)

7

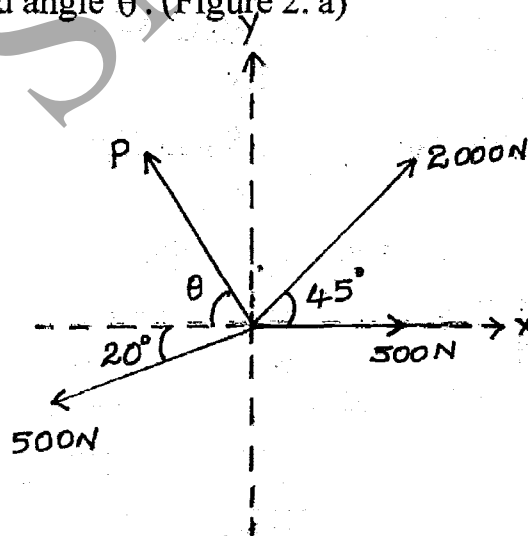


Figure 2. a

P.T.O.



- b) Find the resultant of a set of coplanar forces acting on a lamina as shown in Figure 2 b. Each square of $1\text{ m} \times 1\text{ m}$ size. Locate the resultant with respect of 0. 8

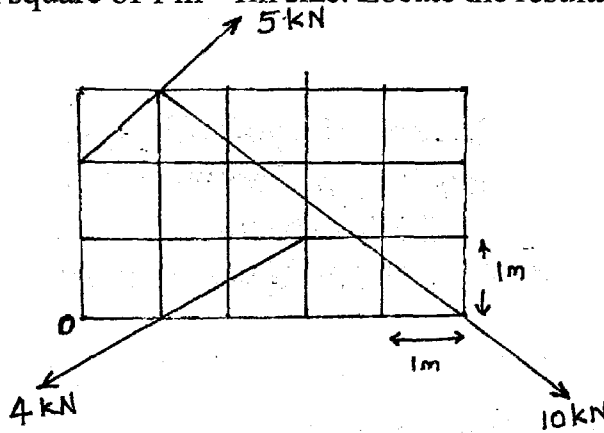


Figure 2. b)

OR

- c) Two cylinders of diameters 100 mm and 50 mm weighing 200 N and 50 N respectively are placed in a trough as shown in Figure 2 c. Find the reactions at contact surfaces. 15

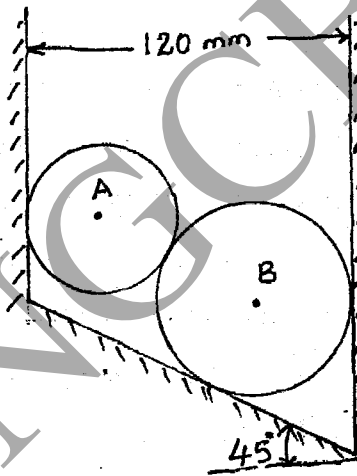


Figure 2. c)

3. a) Locate the centroid of the lamina as shown in Figure 3 a. 7

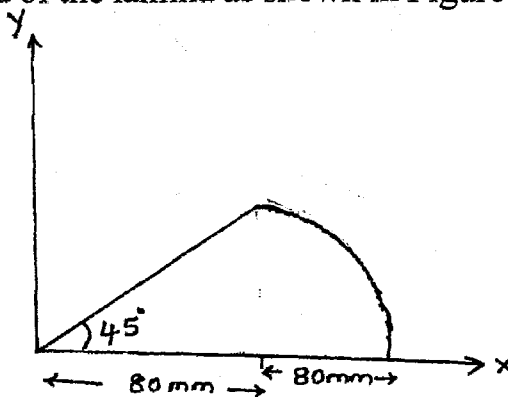


Figure 3. a)



- b) In Figure 3 b, if the weight of the block A is 500 kN find the minimum weight of the block B for motion to be impending. $\mu=0.2$ for all surface. 8

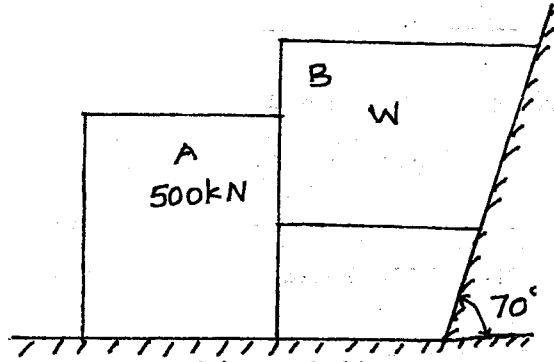


Figure 3. b)

OR

- c) Determine M. I. of Figure 3c about centroidal axis. Also find radius of gyration about this axis. 15

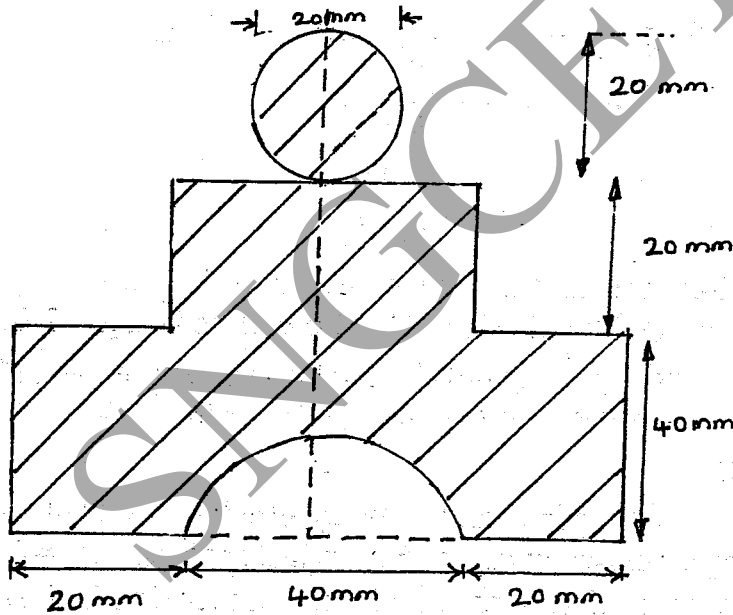


Figure 3. c)

4. a) Find the reactions at the support of the beam loaded as shown in Figure 4 a. 7

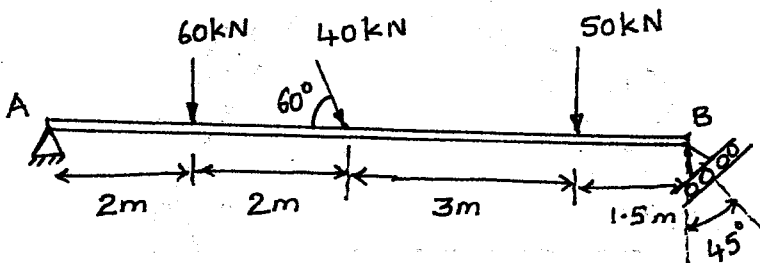


Figure 4. a)



- b) Draw the shear force and bending moment diagram for a beam as shown in Figure 4 b. 8

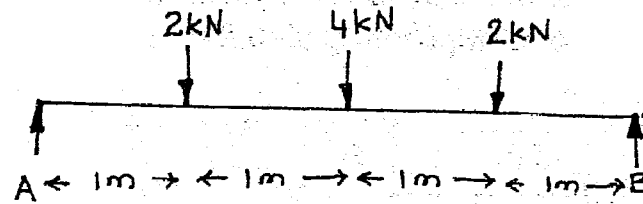


Figure 4. b)

OR

- c) Determine the forces in all the members of the truss as shown in Figure 4 c. 15

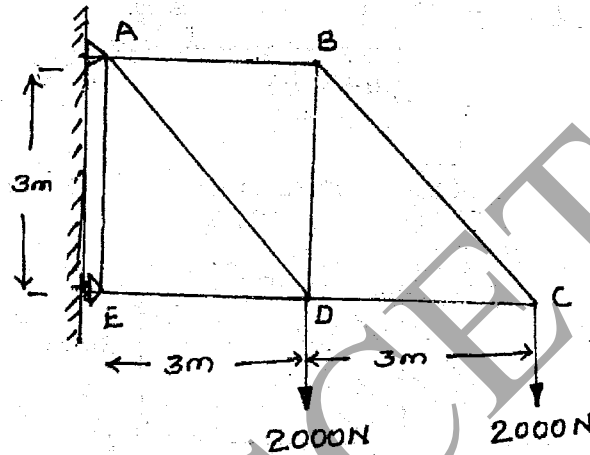


Figure 4. c)

5. a) A particle falls from rest and in the last second of its motion it passes 70 mts. Find the height from which it fell and the time of its fall. $g = 9.8 \text{ m/sec}^2$. 7
- b) A particle falling under gravity falls 30 mts in a certain second. Find the time required to cover the next 30 mts. Take $g = 9.8 \text{ m/sec}^2$. 8

OR

- c) A 50 kg block A on a 30° plane and a 100 kg block on a 60° plane connected by an inelastic string as shown in Figure 5 c are just set free. If $\mu = 0.25$ for both the plane. Find the acceleration of the blocks and the tension in the string. 15

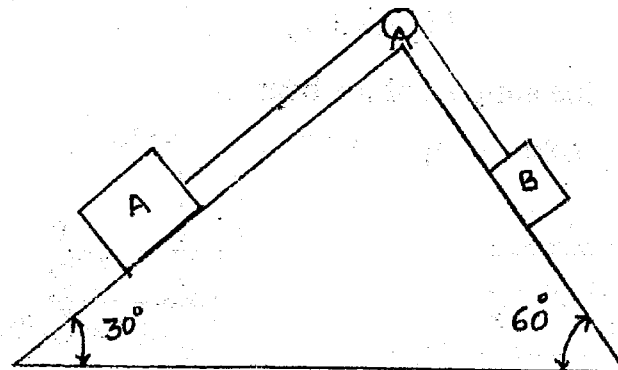


Figure 5. c)



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2K6EN105 : ENGINEERING GRAPHICS

(For CE/ME Branches)

Time: 3 Hours

Max. Marks: 100

Instructions: 1) Answer any five questions.

2) Use first angle projection system.

1. a) A point 20 mm behind VP, 40 mm above HP and 25 mm behind left PP. Draw its projection . 8

b) The front view of a line is 50 mm long and 55° to the XY line. The line is inclined at 30° to VP. Draw the projections of the line and find its true length and true inclination with HP. One end is nearer to HP than the other end which is nearer to VP. 12

OR

c) A pentagonal plane figure of side 40 mm is resting on one of its edges on HP with the corner opposite to that edge touching VP. This edge is parallel to VP and the corner which touches VP is at a height of 25 mm above HP. Draw the projections of the plane figure and determine the inclination of the plane figure with HP and VP and the distance at which the parallel edge lies from VP. 20

P.T.O.



2. a) A hexagonal prism, 30 mm side of base and axis 60 mm long is placed on one of its base edges on HP such that the axis is inclined at 30° to VP and 45° to HP and the base of the prism is nearer to the observer. Draw the projection. 20

OR

- b) A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests makes equal inclinations with H.P. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40° and to VP at 30° . 20
3. a) A cone, base 60 mm diameter and axis 70 mm stands vertically with its base on HP. A section plane perpendicular to VP and parallel to one of the end generators of the cone passes at a distance of 15 mm from it. Draw the sectional top view and true shape of the section. 20

OR

- b) A right regular hexagonal pyramid of 30 mm side of base and height 70 mm stands with its base on HP with one of the base edges parallel to VP. A circular through hole of 30 mm diameter is drilled through the pyramid such that the axis of the hole is perpendicular to VP and intersects the axis of the pyramid 20 mm above the base. Draw the development of the lateral surface of the pyramid showing the true shapes of the holes formed on it. 20
4. a) A combination of solids is formed as follows :
- A frustum of a cone 25 mm top diameter, 50 mm bottom diameter and 50 mm high is placed vertically on a cylindrical block of 75 mm diameter and 25 mm thick such that both the solids have the common axis. Draw the isometric projection of the combination of solids. 20

OR

b) Fig. (1) shows a machine component. Draw the following views :

20

- a) Front view
- b) Top view and
- c) Side view from left

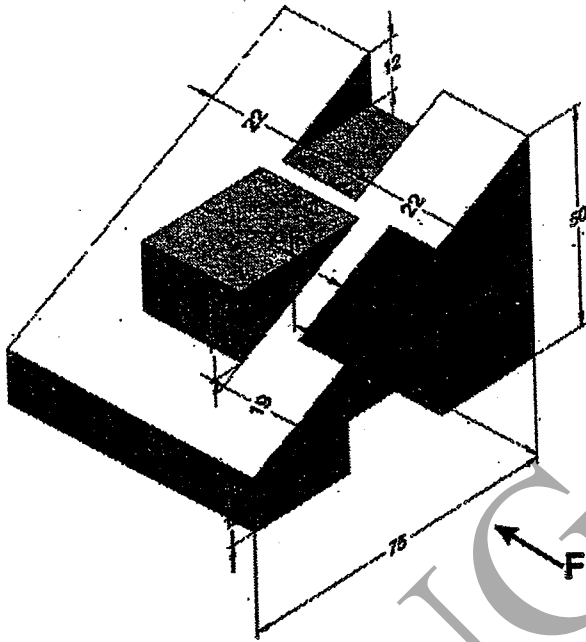


Fig. 1

5. a) Draw the three views of ISO threaded hexagonal bolt 100 mm long, 20 mm diameter and a thread length of 50 mm and hexagonal nut assembly in the axis horizontal position. Indicate all the proportions and the actual dimensions.

20

OR

- b) Draw the half sectional front view and side view of a protected type flange coupling. Take diameter as 20 mm.

20



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– including Part Time) Degree Examination, April 2011
(2007 Admn.)**

2K6 EN 105 : ENGINEERING GRAPHICS

Time: 3 Hours

Max. Marks: 100

Instructions : 1) Answer any five questions.

2) Use first angle projection system.

1. a) Draw the projections of a point A lying 30 mm above HP and in first quadrant, if its shortest distance from the line of intersection of HP and VP is 50 mm. Also find the distance of the point from VP. 8

b) The top view PQ of a straight-line is 70 mm and makes an angle of 60° with XY line. The end Q is 10 mm in front of VP and 30 mm above the HP. The difference between the distances of P and Q above the HP is 45 mm, draw the projections. Determine its true length and true inclinations with HP and VP. 12

OR

c) A regular pentagonal lamina of 25 mm side is resting on one of its corners on HP while the side opposite to this corner touches VP, if the lamina makes an angle of 60° to HP and 30° to VP, draw the projections of the lamina. 20

2. a) A hexagonal prism 25 mm side of base and 50 mm axis length rests on HP on one of its edges of the base. Draw the projections of the prism when the axis inclined to HP at 45° and VP at 30° . 20

OR

b) A pentagonal pyramid 25 mm sides of base and 50 mm axis length is suspended freely from a corner of its base. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45° .

3. a) A square pyramid base 40 mm side and axis 65 mm long has its base on HP and all the edges of the base are equally inclined to VP. It is cut by an inclined section plane so as the truncated surface at 45° to its axis, bisecting it. Draw the development of the truncated pyramid. 20

OR

P.T.O.



- b) A cylinder 60 mm diameter and 80 mm long stands with its circular base on HP. A section plane perpendicular to VP and inclined at 60° to HP cuts the axis at a point 28 mm below its top end. Draw the sectional top view and true shape of the section. 20
4. a) A frustrum of cone base diameter 50 mm, top diameter 25 mm and height 50 mm is placed centrally on a cylindrical slab of diameter 10 mm and thickness 30 mm. Draw the isometric projection of the combination. 20

OR

- b) Fig (i) shows the isometric view of a component. Draw to a suitable scale the three views of the object when looked in the direction of arrow shown. 20

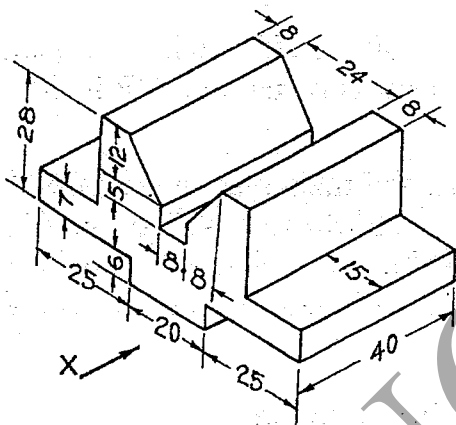


Fig. (i)

5. a) Draw the two views of ISO threaded square bolt 100 mm long, 20 mm diameter and thread length 50 mm and square nut assembly in the axis horizontal position. 20

OR

- b) Draw the full sectional front view and side view of a knuckle joint of diameter-20 mm. 20



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Degree Examination, April 2011
(2007 Admn.)**

**2K6EN105 : ENGINEERING GRAPHICS
(For CS/AEI/IT Branches)**

Time: 3 Hours

Max. Marks: 100

Instructions : 1) Answer any five questions.
2) Use first angle projection system.

1. a) A point is 30 mm in front of VP, 20 mm above HP and 25 mm in front of left PP. Draw its projection. 8
- b) A line PQ has its end P, 15 mm above HP and 10 mm in front of VP. The end Q is 55 mm above HP and the line is inclined at 30° to HP. The distance between the end projectors of the line when measured parallel to the line of intersection of HP and VP is 50 mm. Draw the projections of the line and find its true length and true inclinations with VP. 12
- OR
- c) A square plate of 40 mm sides rests on HP such that one of the diagonals is inclined at 30° to HP and 45° to VP. Draw its projections. 20
2. a) A cone of base 80 mm diameter and height 100 mm lies with one of its generators. On HP and the axis appears to be inclined to VP at an angle of 40° in the top view. Draw its top and front views. 20
- OR
- b) A hexagonal pyramid, base 30 mm side and axis 60 mm long has one of its slant edges on HP such that two of its triangular faces containing the slant edge on which it rests are equally inclined to HP. The top view of the axis appears to be inclined at 45° to VP. Draw its projections when its base is near to the observer than its apex. 20

P.T.O.



3. a) A cylinder 60 mm diameters and 80 mm long stands with its circular base on HP. A section plane perpendicular to VP and inclined at 60° to HP cuts the axis at a point 28 mm below its top end. Draw the sectional top view and right views and the true shape of section.

20

OR

- b) A pentagonal pyramid of 30 mm edge of base and 60 mm high rests vertically with one of its base edges parallel to VP and nearer to it. It is cut by a section plane as shown in Fig. (1). Draw the development of the lateral surfaces of the lower portion of the pyramid.

20

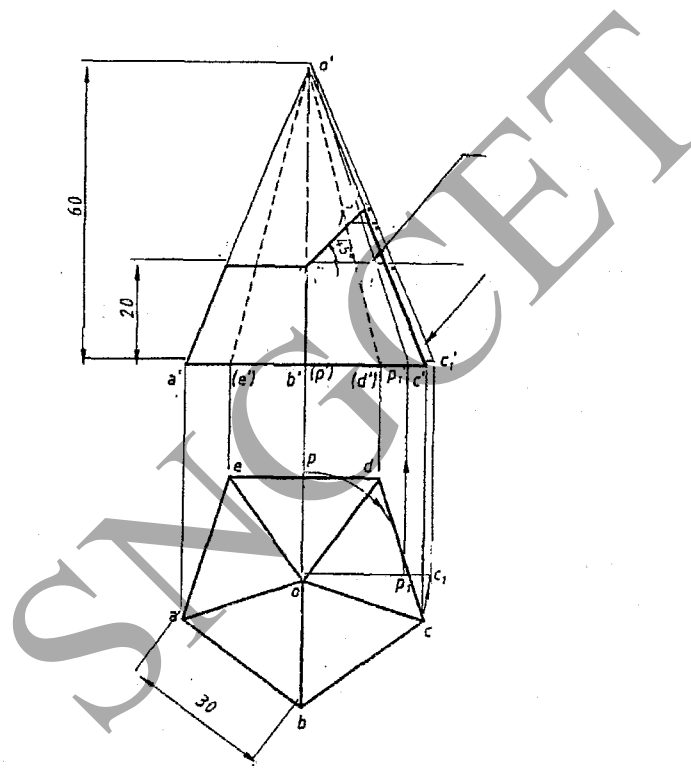


Fig.1

4. a) A combination of solids is formed as follows : A vertical cylinder of 20 mm diameter and height 25 mm is placed centrally over the rectangular face of a horizontal prism of 25 mm side and axis 60 mm. Draw the isometric projection of the combination of solids.

20

OR



- b) Fig. 2 shows a machine component. Draw the following views : 20
- Front view
 - Top view and
 - Side view front left.

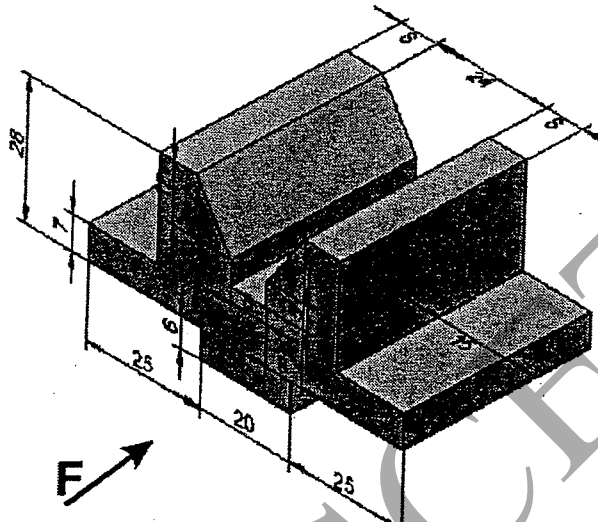


Fig. 2

5. a) Draw the three views of ISO threaded bolt 100 mm long, 20 mm diameter and a thread length of 50 mm and hexagonal nut assembly in the axis horizontal position. Indicate all the proportions and the actual dimensions. 20
- OR
- b) Draw the sectional front view and top view of a Knuckle joint having diameter 20 mm. 20



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**Combined I and II Semester B.Tech. (Regular/Supplementary/Improvement
including Part Time) Degree Examination, April 2011
(2007 Admn.)
2K6EN 106 : BASIC CIVIL ENGINEERING**

Time : 3 Hours

Max. Marks : 100

Instructions : 1) Answer the following questions.

2) Draw neat sketches wherever required.

1. a) Write a note on direct method of chaining on sloping ground.
 - b) List and briefly explain the temporary adjustments of a dumpy level.
 - c) Write a note on components of a building.
 - d) Briefly explain an ideal fire resisting material.
 - e) What are the features of Flemish bond in brick masonry ?
 - f) Write a note on Raymond piles.
 - g) List the different qualities of ingredients of concrete.
 - h) What are the advantages of RCC over PCC ? (8×5=40)
 2. a) Write a note on recording measurements in a field book. 7
 - b) The distance between two stations was measured with a 20 m chain and found to be 1500 metres. The same was measured with a 30 m chain and found to be 1476 metres. If the 20 m chain was 5 cm too short, what was the error in the 30 m chain ? 8
- OR
- c) Explain briefly indirect methods of chaining on sloping ground. 7
 - d) Explain how linear measurements are measured using total station. 8

P.T.O.



3. a) How is our country is divided into different zones under earthquake zoning ?
Explain. 7
- b) Explain briefly disaster mitigation methods related to earthquake. 8
- OR
- c) Write a note on fire hazards in building. 7
- d) What are fire escape elements ? Explain. 8
4. a) Explain the situations in which the pile foundation is preferred. 7
- b) Enumerate the quality of materials used for the construction of doors and windows. 8
- OR
- c) What do you understand by raft and foundation ? When do you prefer this ?
Explain. 7
- d) Explain the features of an English bond in brick masonry. 8
5. a) List and explain the good qualities of aggregates used in concrete. 7
- b) Write a note on any one lab test on workability of concrete. 8
- OR
- c) List and explain the properties of HYSD steel in building construction. 7
- d) What is the need of grading curve and fineness modulus in aggregate ? Explain. 8
-



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2K6EN107 : BASIC MECHANICAL ENGG.**

Time : 3 Hours

Max. Marks : 100

Instructions : i) Answer all questions.

ii) Missing data if any may be suitably assumed.

1. a) Define 'internal energy'. Also prove that it is a property of the system.
 - b) Derive the expression for work transfer in a polytropic process.
 - c) Give comparison between two stroke and four stroke engines.
 - d) Sketch and explain the working principle of centrifugal pump.
 - e) Draw the temperature – enthalpy diagram of formation of steam. Also represent and define the following on it :
Saturation temperature, sensible heat, latent heat.
 - f) Define and explain relative humidity, specific humidity and degree of saturation.
 - g) Sketch and explain the principle of extrusion.
 - h) What is cylindrical grinding ? Explain with a neat sketch. (5×8=40)

 2. a) A Centigrade and Fahrenheit thermometers are both immersed in a fluid, and the numerical value recorded on both thermometers is same. Determine the temperature of the fluid expressed as °K and °R and also find that identical value shown by thermometers. 10
 - b) State and explain first law of thermodynamics. 5
- OR
- c) A gas occupies 0.3 m^3 at 2 bar. It executes a cycle consisting of following processes :
 - i) 1-2 constant pressure process with work interaction of 15 kJ
 - ii) 2-3 Isothermal compression process

P.T.O.



iii) 3-1 - constant volume process in which decrease in internal energy is 40 kJ. Neglect changes in KE and PE. Draw P-V diagram for the processes and determine network transfer for the cycle. Also show that first law is obeyed by the cycle. 15

3. a) In an air standard diesel cycle, clearance volume is 7% of the stroke volume. The pressure and temperature of air at the beginning of compression are 1 bar and 27° C. The maximum temperature in the cycle is 1900 K. Calculate the following :

i) Compression ratio

ii) Cut-off ratio

iii) Heat transferred to air in kJ/kg

iv) Heat transferred from air in kJ/kg.

v) Cycle efficiency. 15

OR

b) Sketch and explain the working of :

i) Pelton turbine

ii) Kaplan turbine. 15

4. a) List various boiler mountings and accessories. Also mention their location and functions. 15

OR

b) Sketch and explain the working of vapour absorption refrigeration system. Also name some commonly used refrigerants and their specific applications. 15

5. a) Sketch and explain the principle of :

i) Welding

ii) Soldering

iii) Brazing. 15

OR

b) Draw a neat sketch of Engine Lathe and label its parts. Also give a list of various operations that can be performed on lathe. 15



Reg. No. :

Name :

**Combined I and II Semester B.Tech. (Reg./Sup./Imp.including Part Time)
Degree Examination, April 2011
(2007 Admn.)**

2K6EN 108 : BASIC ELECTRICAL ENGINEERING

Time: 3 Hours

Max. Marks: 100

Instruction : Answer all questions.

- I. a) List the advantages and disadvantages of a nuclear power plant.
 b) Draw and explain switchboard wiring for a domestic lighting circuit.
 c) Define power factor and explain its significance.
 d) Explain the construction and operation of any one type of stepper motor.
 e) Draw the neat sketch of a vertical core type furnace (Ajay Wyalt furnace) and explain its principle.
 f) What is the fundamental difference between electric arc welding and resistance welding?
 g) Explain the procedure to measure humidity.
 h) Write the applications of Meggar. (5×8=40)
- II. a) Explain with a neat diagram the concept of geothermal energy. What are its limitations? 8
 b) Write explanatory note on Miniature Circuit Breaker (MCB) and Earth leaky circuit breakers. Explain their necessities and specifications. 7
- OR
- c) Explain the advantages of hydro electric power generation . What are the obstacles is starting a new hydro power plant ? 8
 d) Explain the functions of Isolators, Lightning arrestors and Wave traps. 7

P.T.O.



- III. a) Explain :
- Flat rate tariff
 - Block rate tariff
 - Power factor tariff
 - Two part tariff. 8
- b) A 3 phase 50 Hz, 20 poles salient pole alternates with star connected stator winding has 180 slots on the stator. Each slot consist of 20 conductors. The flux per pole is 25 mWb and is sinusoidally distributed. The coils are full pitch. Distribution factor is 0.9597.
- Calculate :
- speed at which alternatives driven
 - generated emf per phase. 7
- OR
- What do you mean by back emf of a d.c. motor and explain its significance. 7
 - Explain the constructional features of a poly phase induction motor indicate the types of rotors used in the induction motor. 8
- IV. a) Explain the concept of dielectric healing and mention its applications. 7
- b) Describe with a neat diagram ultrasonic welding. 8
- OR
- With a neat diagram explain the operation of sodium vapour lamp. Mention the applications of sodium lamp and halogen lamp. 8
 - Explain the charging methods used for charging lead acid baltines. What are the precautions to be taken ? 7
- V. a) Explain the construction and basic principle of operation of induction energy meter. 8
- b) Describe with a neat diagram the construction and principle of operation of moving Iron attraction type ammeter. 7
- OR
- Explain with a neat diagram principle of piezo electric transducer used for measurement of pressure. 6
 - What is tranducer ? Explain the classification of transducers depending on various parameters. 9



Reg. No. :

Name :

**Combined I & II Semester B.Tech. (Reg./Sup./Imp.) including Part Time
Degree Examination, April 2011
(2007 Admn.)**

2K6EN109 : BASIC ELECTRONICS AND COMPUTER ENGINEERING

Time: 3 Hours

Max. Marks : 100

Instruction : Answer all the questions.

PART – A

- | | |
|---|---|
| I. 1) List the features of LED that makes it widely applicable. | 5 |
| 2) What are integrated circuits ? | 5 |
| 3) What are optical fibres ? | 5 |
| 4) Brief out the advantages of cellular communication. | 5 |
| II. 5) a) Give the detailed construction of BJT npn type transistor. | 8 |
| b) Explain FM. Give the transmitter model for FM. | 7 |
| OR | |
| 6) a) Give the VI characteristic of pn junction diode. | 7 |
| b) Explain detailed working of RC phase shift oscillator. | 8 |
| III. 7) a) Explain amplitude modulation and also give AM transmitter block diagram. | 8 |
| b) What are RADARs ? Explain pulsed RADAR model. | 7 |
| OR | |
| 8) a) Give the block diagram of optical communication system and briefly explain. | 7 |
| b) What are the frequency bands in microwave communication ? List their uses also. | 8 |

P.T.O.



PART – B

- IV. 1) Write a note on drive controllers and drives. 5
- 2) Give the classifications of computer. 5
- 3) What is computer programming ? 5
- 4) Give the future internet applications. 5
- V. 5) a) What are processors and how do they differ from microcontrollers ? 8
- b) Explain how graphic adapters enhances image on monitors. 7
- OR
- 6) a) Write a procedure to find if a word is palindrome. 7
- b) What are plug and play devices are, what are their advantages ? 8
- VI. 7) a) Differentiate between high level and low level languages. 7
- b) Explain wireless and wired configuration of communication. Compare their features also. 8
- OR
- 8) a) Write a note on personal assistance. 7
- b) Give the algorithm and flowchart to find the largest of 3 numbers. 8
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