Q.P. Code :013176

[Time: 02 Hours] **[Marks:60]**

Please check whether you have got the right question paper.

N.B:
1) Questions no.1 is compulsory.
2) Attempt any three questions from remaining five questions.
3) Figures to the right indicate full marks.
4) Atomic alt:-Al=27, Ca=40, S=32, Cl=35.5, Fe=56, K=39, C=12, N=14, O=16, Na=23, Mg=24.

Q.1 Attempt **any five** of the following 15

(a) Define power alcohol. Give any two advantages of power alcohol.
(b) Explain why cathodic coating is preferred over anodic coating for manufacturing of containers to store food stuffs.
(c) A sample of coal has the following composition:-

C = 70%, O = 23%, H = 5%, S =1.5%, N = 0.4%, Ash = 0.1%,

calculate the G.C.V. of this fuel.

(d) Give the composition, properties and uses of high phosphorus bronze.
(e) Why is it essential to design safer chemicals and products w.r.t. green chemistry principle? Explain with an example.
(f) What is the matrix phase and particle phase in concrete? Give any two properties of concrete.
(g) Porous film is also called as 'Non protective film'. Explain with an example.

Q.2 (a) Define electrochemical corrosion. Explain Intergranular corrosion with a neat labelled diagram. 06
(b) i) 1.95 gm of a coal sample was taken for nitrogen estimation by Kjeldahis's method. The ammonia liberated required 9.5ml of 0.4 N H2SO4 for neutralisation. Calculate the percentage of Nitrogen in coal sample. 03
ii) Write a note on Green solvents 02
(c) Explain the structural composition of plywood. 04

Q.3 (a) Define fuel cell. Explain Hydrogen Oxygen fuel cell with a neat labelled diagram. 06
(b) i) Define shape memory Alloy. Give its properties and uses. (Any two) 03
ii) Define Bio-Diesel and give its advantages. 02
(c) Calculate the % atom ecovomy of the following reaction w.r.t. the product acetophenone. 04

$C_6H_6 + CH_3COCl \rightarrow C_6H_5COCH_3 + HCl$

Acetophenone

TURN OVER

Q.4 (a) What is cathodic protection? Explain impressed current cathodic protection with its applications. 06

(b) i) What is Green chemistry? Give its significance. 03

ii) Define composite. Give any two applications of composite material 02

(c) What is powder metallurgy? Explain hot compaction method with a neat labeled diagram. 04

Q.5 (a) A gaseous fuel contains H_2 = 50%, CH_4 = 30%, N_2 = 2%, CO =7%, C_2H_4 = 3%, C_2H_6 = 5%, and watervapour=3%, Calculate weight and volume of air required for $2m^3$ of the gas. [Given: Mol. Wt. of an air =28.949kg] 06

(b) i) List the three main constituents of paint and give functions of each. 03

ii) Explain the effect of the following alloying elements on steel. 02

a) Chromium b)Tungsten

(c) Explain conventional and Green chemistry route for production of Ibuprofen Highlight the green chemistry principle involved. 04

Q.6 (a) Write short notes on:- 06

a)Computing b) Sintering

(b) i) What are Fiber Reinforced composite 03

ii) Explain how areas of anode and cathode effect the rate of corrosion 02

(c) Explain the determination of % moisture and % volatile matter in a coal sample. 04

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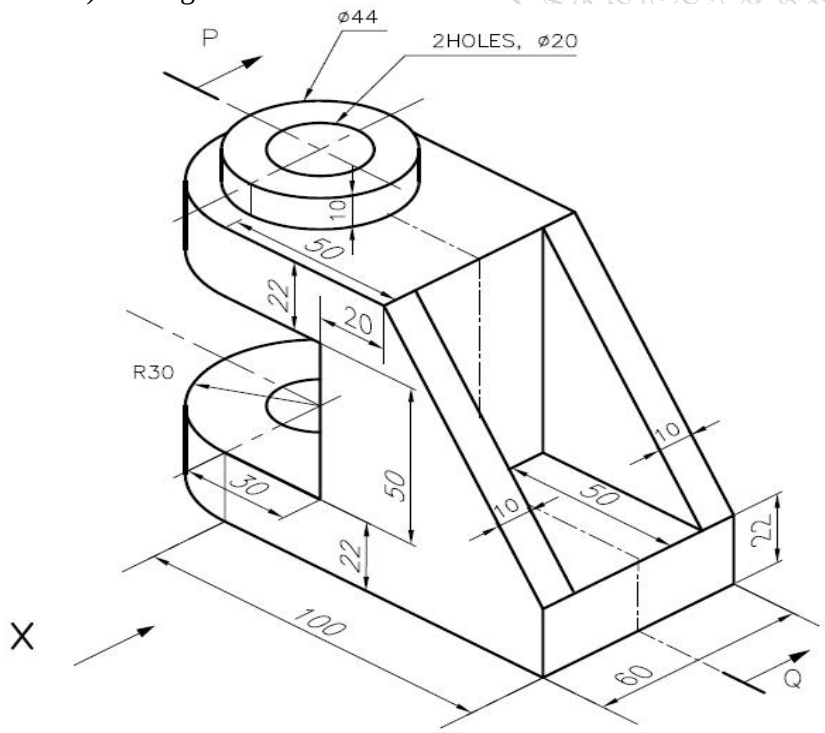
(3 Hours) **[Total Marks:60**

i) Solveany **FOUR** questions.
ii) All dimensions are in mm.
iii) Use first angle method of projection.
iv) Assume suitable dimension if it is necessary.
v) Retain all construction lines.

Q.1 Following figure shows the pictorial view of an object, draw
- i) Sectional front view along section P-Q **[5]**
- ii) Top view. **[4]**
- iii) Right Hand Side view **[4]**



iv) Insert 10 major dimensions **[2]**

Q.2 A pentagonal pyramid side of base 35mm and height 70mm is having one of its base edge in HP with triangular surface containing this edge perpendicular to HP, parallel to VP and away from observer. Draw its projections. **[15]**

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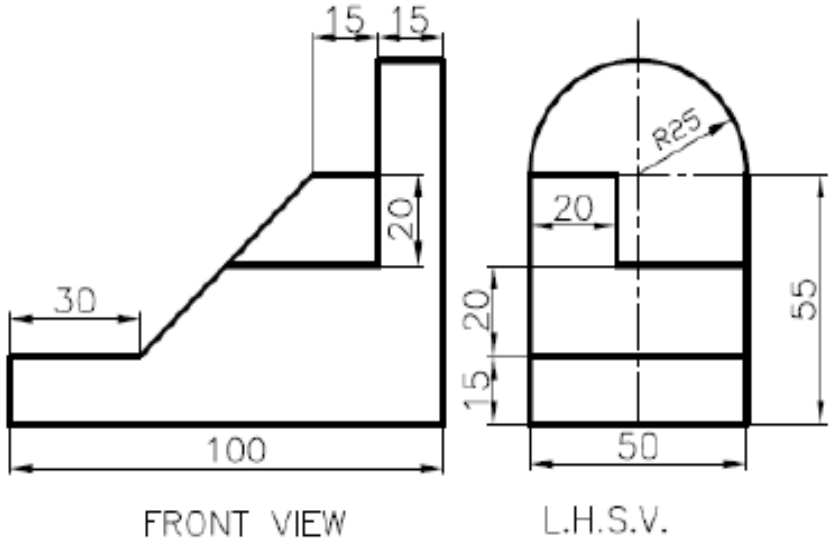
[TURN OVER

Q.3 (a) Front view and side view of an object is shown in figure, draw an Isometric View. **[8]**



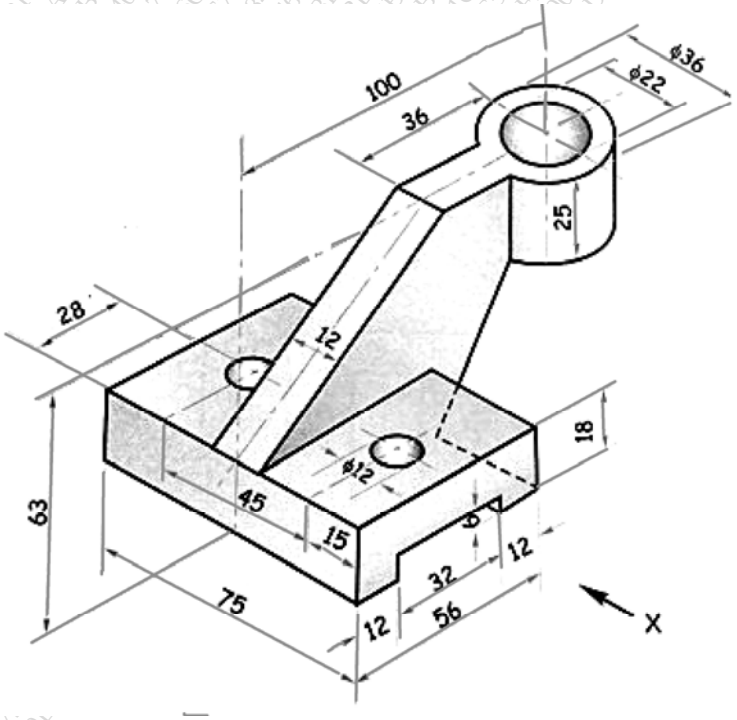
(b) Draw the elevation and plan of a cube of side 50mm resting on one of its corner of base on HP with solid diagonal perpendicular to the VP. **[7]**

Q.4 (a) The pictorial view of a machine part is shown in following figure. Draw

i) Front view from X **[4]**

ii) Top view **[4]**

iii) Insert at least 6 Dimensions. **[1]**



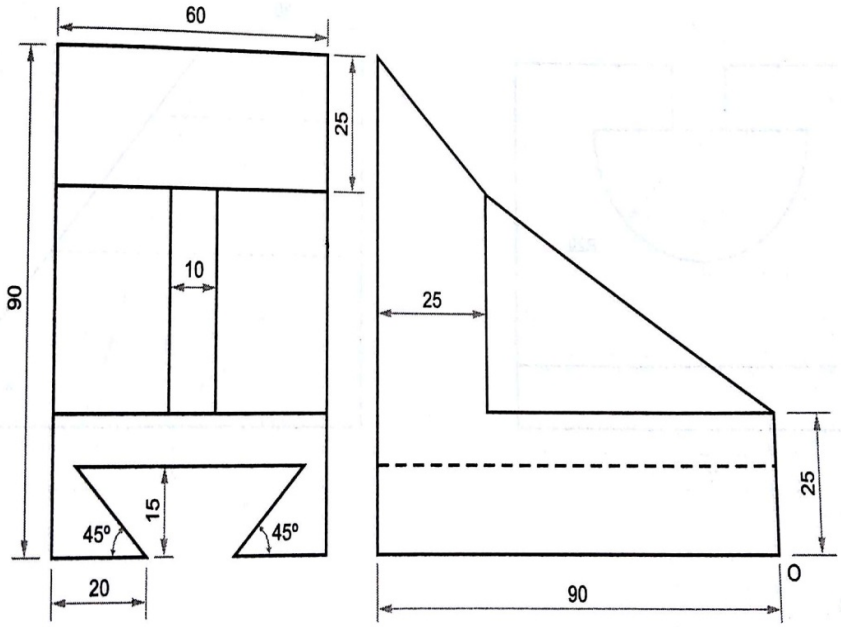
(b) Draw 1.5 revolution of a cylindrical helix of pitch 60mm on a cylinder of 50mm diameter. **[6]**

[TURN OVER

Q.5 A right circular cone having diameter of base 60mm, axis length 80mm resting on its base on HP is cut by cutting plane perpendicular to VP and inclined to HP at 60°, bisects the axis. Draw its FV, sectional TV and the true shape of section. Also draw the development of lateral surface of the cone after removing the portion containing the apex. **[15]**

Q6 (a) End A of line AB is in second quadrant and is 40mm and 15mm from HP and VP respectively. The line is inclined at 40° to both the reference planes. Draw its projection when end B is in third quadrant and 45mm from HP. Find true length and distance of end B from VP. **[8]**

(b) Front view and sideview of an object are shown in figure, draw an isometric view. **[7]**



Q. P. Code : 22296

Duration – 3 Hours **Total Marks : 80**

(1) N.B.:- Question no 1 is compulsory.

(2) **Attempt any THREE questions out of remaining FIVE questions.**

Q.1) a) Solve $\frac{dy}{dx} = \frac{y+1}{(2+y)e^{y} - x}$ (4)

b) *Solve* $(D^2+1)^3 y = 0$ (3)

c) Evaluate $\int_0^4 x^2 \sqrt{4x - x^2}\, dx$ (3)

d) Express the following integral in polar co-ordinate **(4)**

$$\int_0^a \int_0^x f(x,y)\, dx\, dy$$

e) Prove that $E \nabla = \nabla E$ (3)

(3)

f) Evaluate $I = \int_0^{\pi/4} \int_0^{\sqrt{\cos 2\theta}} \frac{r}{\left(1+r^2\right)^2} dr\, d\theta$

(6)

Q.2 a) Solve $x\frac{dy}{dx} + y = y^2(\log x)$ (6)

b) Change the order of integration and evaluate $I = \int_0^1 \int_{x^2}^{2-x} yx\, dy\, dx$. **(8)**

c) Evaluate $\int_0^{\pi/2} \frac{dx}{1 + a\sin^2 x}$ and hence deduce that

$$\int_0^{\pi/2} \frac{\sin^2 x}{\left(3+\sin^2 x\right)^2} dx = \frac{\pi\sqrt{3}}{96}$$

Q.3 a) Evaluate $I = \int_0^1 \int_{y^2}^1 \int_0^{1-x} x\, dz\, dx\, dy$ (6)

b) Find the mass of a plate in the form of a cardiode $r = a(1 - \cos\theta)$ if the density at any point of the plate varies as square of its distance from the plate. (6)

c) Solve $(3x+1)^2 \frac{d^2y}{dx^2} - 3(3x+1)\frac{dy}{dx} - 12\,y = 9x$ **(8)**

Q. 4 a) Show that the length of the curve $x = a\,e^{\theta}\sin\theta \quad y = a\,e^{\theta}\cos\theta$ from $\theta = 0$ to $\theta = \pi/2$ (6)

b) *Solve* $\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 13\,y = 8e^{3x}\sin 4x + 2^x$ (6)

c) Using fourth order Runge-Kutta method, solve numerically, the differential equation $\frac{dy}{dx} = x^2 + y^2$ with the given condition x = 1, y = 1.5 in the interval (1, 1.2) with h = 0.1 **(8)**

Q. 5 a) Use method of variation of parameters to solve (6)

$$\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + 5y = 4e^{-x}\tan 2x + 5e^{-x}$$

b) Using Taylor's series method, obtain the solution of (6)

$\frac{dy}{dx} = y - xy, \quad y(0) = 2.$ Find the value of y for x = 0.1 correct to four decimal places

c) Evaluate $\int_0^1 \frac{dx}{1+x}$ by using (i) Trapezoidal Rule, (ii) Simpson's $(1/3)^{rd}$ Rule and (iii) Simpson's $(3/8)^{th}$ Rule. Compare the result with exact solution. **(8)**

Q. 6 a) In a circuit of resistance R, self inductance L, the current i is given by by $L\frac{di}{dt} + Ri = E\cos pt$ where E and p are constants. Find the current i at time 't' (6)

b) Find the area between the circles $r = \sin\theta$ and $r = 2\sin\theta$ (6)

c) Find the volume of the paraboloid $x^2 + y^2 = 4z$ cut off by the plane $z = 4$ **(8)**

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Q. P. Code: 24185

[Time: 2 Hours] **[Marks: 60]**

N.B. 1) Question no. 1 is compulsory

2) Solve any 3 questions from question no. 2 to 6.

3) Assume suitable data wherever required.

4) Figures to right indicate full marks.

Q.1. Solve any five from the following. **(15M)**

a) Explain how interference in wedge shaped film is used to test optical flatness of given glass plate.

b) What is diffraction grating? What is the advantage of increasing the number of lines in the grating?

c) With neat ray diagram explain the concept of total internal reflection (TIR).

d) Differentiate between spontaneous and stimulated emission.

e) Find cylindrical coordinates of a point $(3\vec{\imath}+4\vec{\jmath}+\vec{k})$.

f) In Newton's rings pattern what will be the order of the dark ring which will have double the diameter of the 40th dark ring.

g) Draw the block diagram of cathode ray tube (CRT) and briefly explain functions of its parts.

Q.2

a) Derive the conditions for maxima and minima due to interference of light reflected from thin film of uniform thickness**.** **(8M)**

b) Derive the formula for numerical aperture of step index fibre and give its physical significance. The N.A. of an optical fibre is 0.5 and core refractive index is 1.54.Find the refractive index of cladding. **(7M)**

Q.3

a) Discuss the Fraunhofer diffraction at single slit and obtain the condition for minima. In plane transmission grating the angle of diffraction for second order principal maxima for wavelength $5\text{x}10^{-5}$ cm is 35^0 .Calculate number of lines /cm on diffraction grating. **(8M)**

b) What is the difference between photography and holography? Explain holography technique to obtain 3-D image of an object. **(7M)**

Q.4

a) Find the divergence of vector field $\vec{F}= x^2yz\vec{\imath} + xz\vec{\jmath}$ **(5M)**

b) Explain how A.C. voltage and its frequency is measured using CRO. **(5M)**

c) A wedge shaped air film having an angle of 40 seconds is illuminated by monochromatic light and fringes are observed vertically through a microscope. The distance measured between consecutive bright fringes is 0.12 cm. Calculate wavelength of light used. **(5M)**

Q.5

a) Explain Newton's rings experiment and show that diameters of n^{th} dark rings are proportional to square root of natural numbers. **(5M)**

b) Write Maxwell's equations and give its physical significance. **(5M)**

c) Explain construction and working of atomic force microscope. **(5M)**

Q.6

a) Explain different types of carbon nanotubes and give its applications. **(5M)**

b) Explain construction and working of Nd:YAG laser. **(5M)**

c) Write a note on electrostatic focussing. **(5M)**

(2 Hours) **Total marks: 40**

N. B. (1) Question No 1 is compulsory

(2) Attempt any three out of Five questions

1. (a) List 2 situations which could occur in your personal life where you would choose to speak rather than write. Explain the reasons for your choice. (3)
   (b) Give the diagrammatic representation of Complete Block Form (2)
   (c) Explain the relevance of diagrams while describing an object (2)
   (d) Techniques to improve listening skills (3)

2. (a) Explain Proxemics (3)
   (b) Write short notes on completeness (2)
   (c) When is **Note** given in instructions? (2)
   (d) Find one word substitutes for the following phrases: (3)
   (i) An instrument for measuring earthquakes S----------
   (ii) To move from one country to another M------
   (iii) Murder of a new born child I----------

3. (a). How is courtesy shown in business letters? Give at least two examples. (2)
   (b). Meera Biscuits Mart, Lonavala have complained that they received a consignment of 100 kg of biscuits in a broken condition and have asked for adjustment. They have attributed the damage to defective packaging. On behalf of Shandesh Biscuits and Food Products, Mumbai write a suitable reply. (6)

   (c). What is the importance of Feedback in Communication process? (2)

4. (a). Distinguish between oral and written communication. (2)
   (b). Give the difference in meaning for each of the following pairs of words: (2)
   (i) Various , varied
   (ii) Climate , weather
   (c) Your company is organizing a two day conference in New Delhi and you expect Sales Personnel from branches all over India to attend. As the Convener of the conference write to a hotel enquiring about facilities like conference hall, food and accommodation the participants. Give necessary details. (6)

5. (a). Write short notes on: (4)
   (i). Chronemics
   (ii). '**Precaution**' in Instructions
   (b). Describe **Any One** of the following objects: (4)
   (i). Head Phones
   (ii). Scanner

Turn Over

(c). Give the diagrammatic representation of Communication Cycle. (2)

6. (a) Read the following passage and answer the questions given below:

But man is not destined to vanish. He can be killed, but he cannot be destroyed, because his soul is deathless and his spirit is irrepressible. Therefore, though the situation seems dark in the context of the confrontation between the superpowers, the silver lining is provided by amazing phenomenon that the very nations which have spent incalculable resources and energy for the production of deadly weapons are desperately trying to find out how they might never be used. They threaten each other, intimidate each other and go to the brink, but before the total hour arrives they withdraw from the brink.

i. **The main point from the author's view is that** **(01)**
   A. Man's soul and spirit cannot be destroyed by superpowers.
   B. Man's destiny is not fully clear or visible.
   C. Man's soul and spirit are immortal.
   D. Man's safety is assured by the delicate balance of power in terms of nuclear weapons.
   E. Human society will survive despite the serious threat of total annihilation.

ii. **The phrase 'Go to the brink' in the passage means** **(01)**
   A. Retreating from extreme danger.
   B. Declare war on each other.
   C. Advancing to the stage of war but not engaging in it.
   D. Negotiate for peace.
   E. Commit suicide.

iii. **In the author's opinion** **(01)**
   A. Huge stockpiles of destructive weapons have so far saved mankind from a catastrophe.
   B. Superpowers have at last realized the need for abandoning the production of lethal weapons.
   C. Mankind is heading towards complete destruction.
   D. Nations in possession of huge stockpiles of lethal weapons are trying hard to avoid actual conflict.
   E. There is a Silver lining over the production of deadly weapons.

iv. **'Irrepressible' in the second line means** **(01)**
   A. incompatible
   B. strong
   C. oppressive
   D. unrestrainable
   E. unspirited

v. **A suitable title for the above passage is** **(01)**
   A. Destruction of mankind is in evitable.
   B. Man's desire to survive inhibits use of deadly weapons.
   C. Mounting cost of modern weapons.
   D. Threats and intimidation between super powers.
   E. Cowardly retreat by man

6. (b). List any **Ten** Instructions to follow while welding an object. (05)

Q. P. Code: 25643

Time: 2 hours Marks: 60

N. B. 1) Question no 1 is compulsory

2) Attempt any three questions from remaining three questions.

3) Assume suitable data wherever required

4) Figures on the right indicates marks

1		Attempt **any five**	15
	a	In Newton's ring experiment the diameter of 4^{th} dark ring is 0.4cm, calculate the diameter of 20^{th} dark ring.	
	b	What is meant by absent spectra? Write the condition of absent spectra.	
	c	A fiber cable has an acceptance angle of 30^0 and a core refractive index is 1.4. Calculate the refractive index of cladding.	
	d	What is resonance cavity? Explain its importance in Lasers	
	e	What is wave function of matter wave? Explain its physical significance	
	f	How do you measure phase difference between two A.C. signals by CRO?	
	g	Define superconductivity and critical current. Plot the variation of resistance versus temperature in case of superconducting material.	
2	a	For Newton's ring, prove that diameter of n^{th} dark ring is directly proportional to the square root of natural number.	5
		If the diameter of n^{th} and $(n+8)^{th}$ Newton's dark ring are 4mm and 7mm respectively. Determine the wavelength of light used if the radius of curvature is 2 m.	3
	b	Differentiate between Step Index and graded Index optical fiber and derive an expression for numerical aperture of step index optical fiber.	7
3	a	How are lasers different than that of ordinary source of light? With neat diagram explain the construction and working of He- Ne Laser.	8
	b	Why are the fringes in the interference pattern by wedge shaped film straight? Derive the expression for fringe width.	7
4	a	What is grating element? A monochromatic light of wavelength 6.56×10^{-5} cm falls normally on a grating of 2cm wide. The first order maxima is produced at 18^0 14' from the normal. What are the total no of lines on the grating?	5
	b	What is Heisenberg's uncertainty principle? Prove it with single slit electron diffraction.	5
	c	What is critical temperature and critical magnetic field of superconducting material? The transition temperature for Pb is 7.2 k. At 5 k it losses the superconducting property if subjected to magnetic field of 3.3×10^4A/m. Find the critical field at 0k.	5
5	a	For plane transmission grating, prove that the condition of diffraction maximum is $d\sin\Theta=n\lambda$, n=0, 1, 2, 3……	5
	b	Derive one dimensional time dependent Schrodinger wave equation.	5
	c	With neat diagram, explain the construction and working of Scanning electron microscope.	5
6	a	An electron has momentum of 5.4×10^{-14} kg-m/s with an accuracy of 0.05%. Find the minimum uncertainty in the location of electron.	5
	b	With neat diagram explain the construction and working of Cathode Ray Tube.	5
	c	What are Nano materials? Explain one of the methods of its production in detail.	5

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Total Marks: 80 **Hours: 3 hrs**

Note: 1. Question no**. 1** is compulsory.
2. Attempt any **three** questions out of remaining **five** questions.

Q.1. [a] Evaluate $\int_0^\infty 5^{-4x^2}\,dx$. [3]

[b] Solve $\frac{dy}{dx} = xy$ with the help of Euler's method, given that y (0) = 1, and find y when x = 0.3 (h = 0.1). [3]

[c] Evaluate $\frac{d^4y}{dx^4} + 2\frac{d^2y}{dx^2} + y = 0$. [3]

[d] Evaluate $\int_0^1 \sqrt{\sqrt{x} - x}\,dx$. [3]

[e] Solve $(1 + \log xy)dx + \left(1 + \frac{x}{y}\right)dy = 0$. [4]

[f] Evaluate $\int_0^1 \int_0^{\sqrt{1+x^2}} \frac{dxdy}{1+x^2+y^2}$. [4]

Q.2.[a] Solve $xy(1 + xy^2)\frac{dy}{dx} = 1$. [6]

[b] Find the area inside the circle $r = a\sin\theta$ and outside the cardioide $r = a(1 + \cos\theta)$. [6]

[c] Apply Runge-kutta Method of fourth order to find an approximate value of y when x = 0.2 given that $\frac{dy}{dx} = x + y$ when y = 1 at x = 0 with step size h = 0.2. [8]

Q.3.[a] Show that the length of the curve $9ay^2 = x(x-3a)^2$ is $4\sqrt{3}a$. [6]

[b] Change the order of the integration of $\int_0^1 \int_{-\sqrt{2y-y^2}}^{1+\sqrt{1-y^2}} f(x,y)\,dx\,dy$. [6]

[c] Find the volume of the paraboloid $x^2 + y^2 = 4z$ cut off by the plane z = 4. [8]

Q.4. [a] Show that $\int_0^1 \frac{x^a - 1}{\log x}dx = \log(a+1)$. [6]

[b] If y satisfies the equation $\frac{dy}{dx} = x^2y - 1$ with $x_0 = 0$, $y_0 = 1$, using Taylor's Series Method find y at x=0.1 (take h=0.1). [6]

[c] Find the value of the integral $\int_0^1 \frac{x^2}{1+x^3}dx$ using (i) Trapezoidal rule (ii) Simpson's 1/3rd rule (iii) Simpson's 3/8th rule. [8]

Q.5.[a] Solve $(y - xy^2)dx - (x + x^2y)dy = 0$. [6]

[b] Evaluate $\iiint \sqrt{1 - \frac{x^2}{a^2} - \frac{y^2}{b^2} - \frac{z^2}{c^2}}\, dx\, dy\, dz$ over the ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$. [6]

[c] Evaluate $(2x + 1)^2 \frac{d^2y}{dx^2} - 2(2x + 1)\frac{dy}{dx} - 12y = 6x$. [8]

Q.6. [a] A resistance of 100 ohms and inductance of 0.5 henries are connected in series with a battery of 20 volts. Find the current at any instant if the relation between L, R, E is $L\frac{di}{dt} + Ri = E$. [6]

[b] Solve by variation parameter method $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = e^{e^x}$. [6]

[c] Evaluate $\iint xy\,(x - 1)dx\,dy$ over the region bounded by xy = 4, y = 0, x = 1 and x = 4. [8]

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[Time: 2 Hours] **[Marks: 60]**

Please check whether you have got the right question paper.

N.B:
1. Question No.1 is Compulsory.
2. Attempt any **three** questions from remaining **five** questions.
3. Figures to the right indicate Full marks.
4. All questions carry equal marks.
5. Atomic weights: - H=l, C=12, N=14, O=16, S=32, CI=35.5, Ba=137.3, Ca=40. Mg=24, Na=23.

1. Answer **any five** from the following:- **15**

a) Galvanization of iron articles is preferred to tinning. Give reason.
b) What are Fuels? Give characteristics of good fuels.
c) Give Composition, Properties and Uses of **Woods Metal**.
d) What are composite materials? Define matrix and dispersed phase.
e) Explain the principal of green chemistry 'Prevention of waste'.
f) Mention three important constituents of paints with their function.
g) 1.85 g of the same coal sample in a Bomb-calorimeter experiment gave 0.28 g $BaSO_4$. Calculate percentage of S in the coal sample.

2. a) Explain the mechanism of following types of corrosion:- **06**
i) Waterline corrosion ii) Pitting corrosion

b) What is Cracking of hydrocarbons? Explain Fixed bed catalytic cracking. **05**

c) Calculate % Atom Economy for the following reaction with respect to toluene **04**

$C_6H_6 + CH_3CI \xrightarrow{---AICl_3--} C_6H_5CH_3 + HCI$

Benzene Methyl Chloride Toluene

3. a) A fuel sample has the following composition: H_2=60%, C_2H_2=10%, CO=8%, CO_2 = 1 %, and rest is nitrogen. Calculate the volume of oxygen and air required for complete combustion of $5m^3$ of fuel. **06**

b) Explain Conventional and Greener route for synthesis of Adipic acid. Mention the green Chemistry principle involved. **05**

c) How do the following factors related to nature of environment affect corrosion? **04**
i) P^H of medium ii) Moisture

4. a) What are alloys? Explain the purpose of making alloys. **06**

b) What is the principle of cathodic protection? Explain impressed current protection method. **05**

c) Explain laminar composites with example. **04**

5.	a)	Write informative note on Biodiesel.	**06**
	b)	What is powder metallurgy? Discuss any two methods for manufacturing metal powders.	**05**
	c)	Write a note on dispersed phase of composite materials.	**04**
6.	a)	What are the methods of metal coatings? Explain electroplating of metals in detail.	**05**
	b)	A coal sample contains, C=78%, O=12%, H=4%, S=0.5%, and Ash= 5.5%. Calculate the GCV and NCV of given coal sample.	**05**
	c)	What is compaction in powder metallurgy? Explain cold pressing and roll pressing methods in detail.	**05**

Q. P. Code: 40226

Max. Marks: 80 **Time : 3 Hrs**

N.B:

1. **Question No.1 is compulsory**
2. **Answer any three out of remaining five questions**

Q. 1	a.	Define algorithm. Write algorithm to calculate Fibonacci series.	04
	b.	Explain conditional operator with example.	04
	c.	Differentiate between structure and union.	04
	d.	Explain strcmp, strcat functions from string.h	04
	e.	Compare if-else ladder and switch control structure.	04
Q. 2	a.	Write a program to sort elements of array in descending order.	10
	b.	Explain parameter passing with the help of call by value and call by reference. Give example.	10
Q. 3	a.	Explain in detail the concept of structured programming. Define flowchart. Draw flowchart to check given number is prime number or not.	08
	b.	Write a program to calculate GCD and LCM of given number.	07
	c.	Explain concept of recursion with example.	05
Q. 4	a.	Write a program to count vowels, consonants and blank spaces in a given string.	08
	b.	Explain all bitwise operators in C.	06
	c.	Write a program to print following pattern.	06

```
        A
    A   B
A   B   C
A   B   C   D
```

Q. 5	a.	Explain different storage classes in C.	10
	b.	Write a program to create a user defined functions to read matrix, to perform matrix multiplication and to display result matrix.	10
Q. 6	a.	Explain structures in C. Write a program to create structure for cricket player to store his name, number of matches played, number of runs, strike rate. Write a program to store records of 10 cricketers. Display the records according to their runs in ascending order.	10
	b.	Explain different file handling functions in C.	05
	c.	Write a program to reverse a given string.	05

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N.B

(1) Question no. 1 is compulsory.
(2) Attempt any 3 from the remaining questions.
(3) Assume suitable data if necessary.
(4) Figures to right indicate full marks.

(3 Hours) **[Max. Marks 80]**

Q.1 (a) Select the correct option from multiple choice questions. 10

i. Which bitwise operator is used to multiply the number by 2^n where n is number of bits.
A] Bitwise-OR B] Bitwise-AND C] Bitwise Left shift D] Bitwise Right Shift

ii. Which operator has the lowest priority ?
A] ++ B] % C] + D] ||

iii. Which of these is a valid variable declaration?
A] int emp salary; B] float marks_student; C] float roll-no; D] int main;

iv. What will be the output of the following program?

```
void main ( ) {
double x=28;
int r;
r= x%5;
printf (“\n r=%d”, r); }
```

A] r= 3 B] Run time Error C]Compile time Error D]None of the Above

v. What will be the output of the following program?

```
void main( ) {
int x []= {10,20,30,40,50};
print f (“ \n %d %d %d %d “, x [4] ,3[x] ,x[2] ,1[x] ,x[0] ); }
```

A]Error B]10 20 30 40 50 C]50 40 30 20 10 D]None of these

vi. Which of the following is not a keyword of ‘C’ ?
A]auto B]register C]int D]function

vii. What will be the output ?

```
void main ( ) {
int y ;
y=0x10+ 010+10;
printf (“\ny=%x”, y); }
```

A] y = 34 B] x = 34 C] y = 22 D]Error

viii. Study the following C program

```
void main ( )  {
int  a= 0;
 for (  ; a ;);
a++;  }
```

what will be the value of the variable a, on the execution of the above program

A] 1 B] 0 C] –1 D] none of these

ix. Which of the following is used as a string termination character?

A] 0 B] \0 C] /0 D] None of these

x. What will be the output of the following program code?

```
void main ( ) {
char a[]= “Hello World” ;
char *p ;
p=a;
printf(“\n%d %d %d %d”,sizeof(a), sizeof(p),strlen(a), strlen(p) ); }
```

A] 11 11 10 10 B] 10 10 10 10 C] 12 12 11 11 D] 12 2 11 11

Q.1 b State True or False with reason. 10

i. Size of pointer variable is equal to the datatype it points to.
ii. A float constant cannot be used as a case constant in a switch statement.
iii. The statement void p; is valid.
iv. while (0); is an infinite loop.
v. scanf() function is used to input string having multiple words
vi. A function can have any number of return statements.
vii. In a union, space is allocated to every member individually.
viii. An algorithm is a graphical representation of the logic of a program.
ix. Comments in the program make debugging of the program easier.
x. There is no difference between '\0' and '0'.

Q.2 a. i. How to create array of structure variables and assign values to its members? 5

ii. Differentiate between struct and union. When is union preferred over struct? Give one example of each. 5

Q.2 b. i. WAP to print the sum of the following series: 5

$1 + 2^2 + 3^3 + ... + n^n$

ii. Compare the following: 5

i) break and continue statements
ii) if-else and switch statements

Q.3 a. Write a program to calculate number of vowels (a, e, i, o, u) separately in the entered string. 6

b. Predict output of following program segment. 4

[Note: Show pictorial representation]

```
(i)main()
{
      int a,b,*p1,*p2,x,y;
      a=48;b=10;p1=&a;p2=&b;
      x=*p1**p2-8;
      *p1=*p1+*p2;
       y=(*p1/*p2)+20;
       printf("%d %d %d %d %d %d", *p1,*p2,a,b,x,y);
}
```

```
(ii)
main()
{
     int x=4,y=9,z;
     z = x++ + --y +y;
     printf("\n %d %d %d",x,y,z);
     z= --x + x+ y--;
     printf("\n %d %d %d",x,y,z);
}
```

c. An electronic component vendor supplies three products: transistors, resistors and capacitors. The vendor gives a discount of 10% on order for transistors if the order is more than Rs. 1000. On order of more than Rs. 100 for resistors, a discount of 5% is given and discount of 10% is given on orders for capacitors of value more than Rs. 500. Assume numeric code 1, 2 and 3 used for transistors, capacitors and resistors respectively. Write a program that reads the product code and the order amount, and prints out the net amount that the customer is required to pay after discount. (Note: Use switch-case) 10

Q.4 a. What is recursion? WAP using recursion to find sum of array elements of size n. 10

Q.4 b. Write a C program to 10

i. Create a 2D array (Matrix) [in main function]
ii. Write a function to read 2D array(Matrix)
iii. Write a function that will return true(1) if entered matrix is symmetric or false(0) is not symmetric.
iv. Print whether entered matrix is symmetric or not [in main function]

Q.5 a. Implements string copy function STRCOPY (str1, str2) that copies a string str1 (source) to another string str2 (destination) without using library function. 05

b. Explain File handling in c in detail. [Note: Mention file types, file modes, file related functions and its use] 08

c. WAP to print all possible combinations of 1, 2, 3 using nested loops. 07

Q.6 a. WAP to print following pattern for n lines. [Note: range of n is 1-9] 05

```
    1
   121
  12321
 1234321
```

b. WAP to print binary equivalent of entered decimal no. 05

c. What is significance of storage classes? Explain it with relevant examples. 10

****

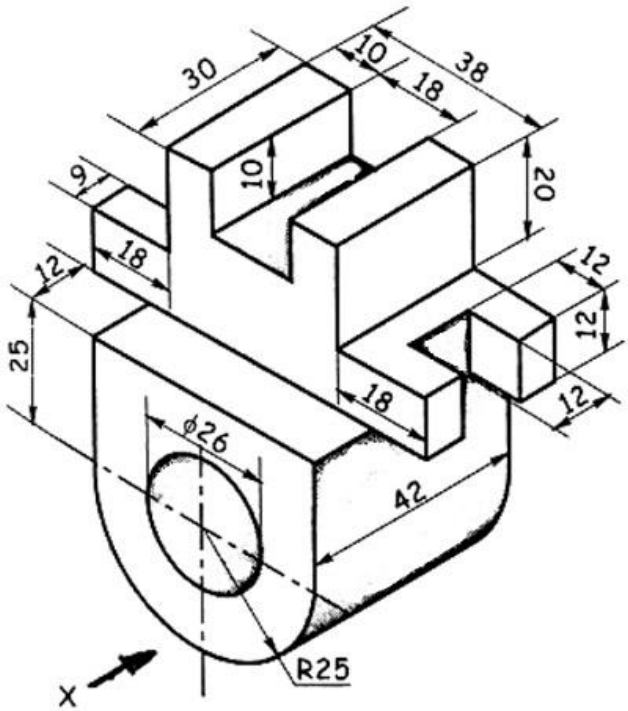
Q. P. Code : 50062

(3 Hours) **[Total Marks: 60]**

N. B. *– 1. Question* ***No. 1*** *is* ***compulsory.***
2. Attempt any three questions out of remaining five questions.
3. ***Use first angle method of projection****, unless mentioned otherwise.*
4. Write all answers on drawing sheets only & use both the sides of the sheets.
5. ***Use your own judgment for any unspecified dimension****.*
6. Retain construction lines.
7. All dimensions are in mm.

Q.1 (a) One end of an inelastic string, 130 mm long is attached to the circumference of a circular disc of 50 mm diameter. The free end of the string is wound around the disc, keeping always tight. Draw the locus of the free end and name the curve. ***(06)***

(b) For the object shown in figure draw the following views -
(i) Front view in the direction of arrow. ***(05)***
(ii) Top view. ***(04)***



TURN OVER

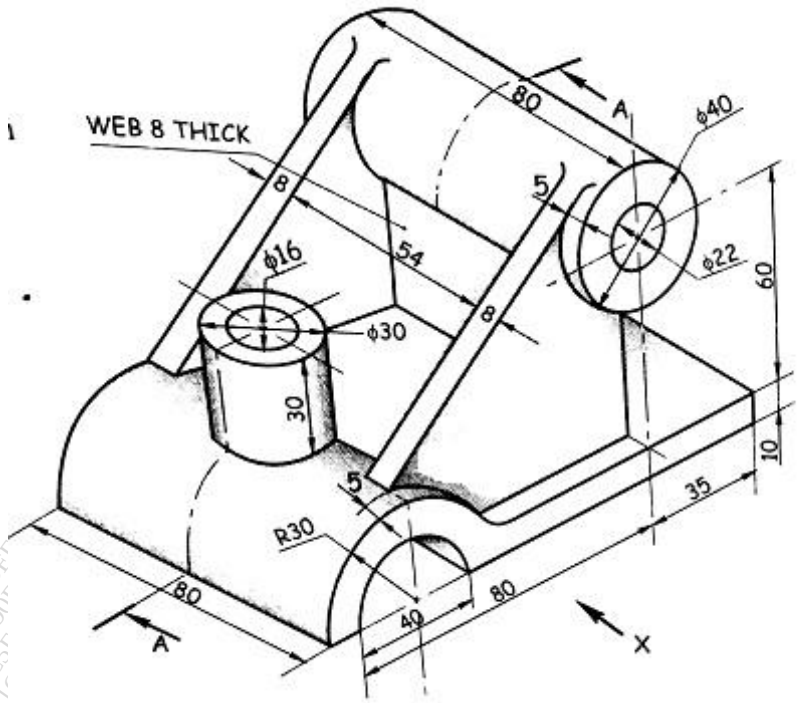
Q. 2 For the object shown in figure draw the following views –

(i) Sectional front view from X direction section along A-A. ***(04)***

(ii) Side view from left ***(04)***

(iii) Top view ***(05)***

(iv) Insert the major dimensions ***(02)***

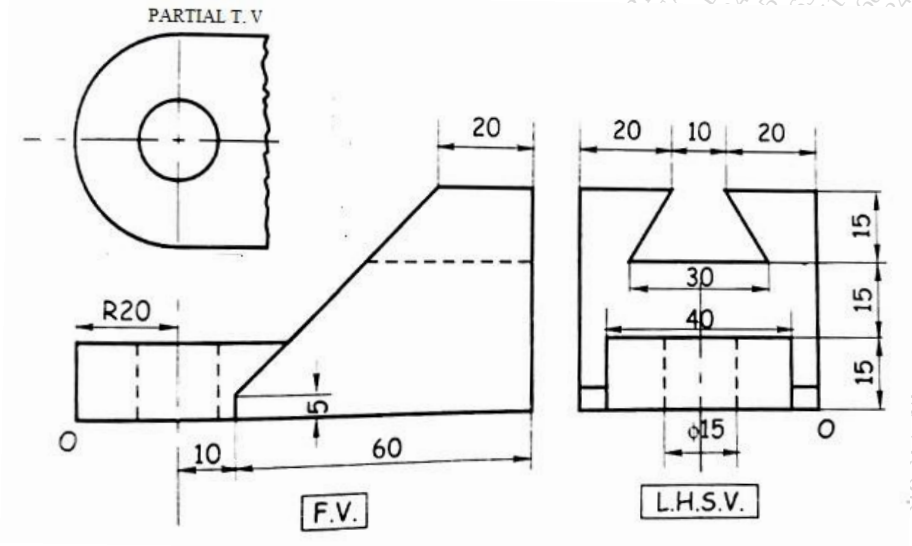


Q. 3 A hexagonal pyramid of 30 mm side of base and slant edges 65 mm long is lying on one of its triangular surface in the VP, so that its axis is inclined at an angle of 45^0 to the HP, Draw its projection if apex is nearer to the observer. ***(15)***

Q. 4 (a) A cylinder of 50 mm diameter of base and 70 mm length of an axis has resting on one point of the circumference in VP. Draw its projections if axis is inclined at 30^0 to VP and parallel to HP. ***(06)***

TURN OVER

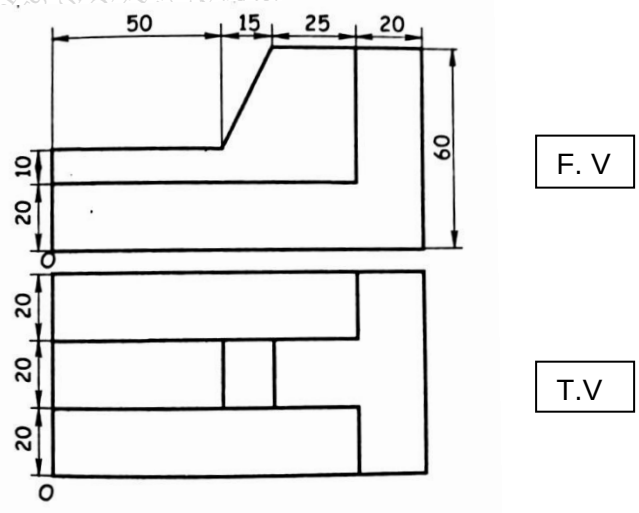
Q. 4 **(b)** Figure shows three views of an object. Draw its isometric view with 'O' as origin. ***(09)***



Q. 5 A cone of base diameter 60 mm and axis height 75 mm is resting on HP on one of its generators with axis parallel to the VP. It is cut by A.I.P. such that the true shape of the section will be a parabola with the axis length equal to 60 mm. Draw the projection of cut solid & D.L.S. of cone removing the apex. ***(15)***

Q. 6 **(a)** The End P of straight line PQ 30mm above HP 40mm in front of VP. The line is inclined at 30° to the HP and 40° with the VP. The Distance between the ends projection measures parallel to XY line is 60mm. Draw the projection if point "Q" is in second quadrant. Find out the true length of the line. ***(09)***

(b) Figure shows two views of an object. Draw its isometric view with 'O' as origin. ***(06)***



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Q. P. Code: 50851

Time: 2 Hrs **Total marks: 40**

Question No. 1 is compulsory

Attempt any three out of the remaining questions

Numbers to the right indicate marks

Q1 a) Explain importance of communication in business. [2]

b) Identify the sender, message, receiver, medium /channel in the following situation: [2]

The doctor informed the members of family about the demise of patient and they all started crying.

c) Mention any four barriers in the process of listening? . [2]

d) Fill in the blanks: [4]

i. An enquiry letter in response to an advertisement_____
ii. Greetings to receiver of a letter_____
iii. Active voice and imperative style is related to_____
iv. The process of joining two metals by using heat is known as _____

Q 2 (a)Explain the importance of sign language over spoken language [2]

(b) Mention atleast three points to overcome Semantic barrier. [2]
.

(c) Your firm of event management received an enquiry letter from a college for organizing their annual event. Draft a quotation letter to be sent to the Principal of the collge. (Use modified form) [6]

Q3 "Communication is the backbone of the organization" Discuss in detail the formal flow of communication [2]

b) What do the following non-verbal cues communicate: [2]

i) Relaxed posture ii) open palms

c). A majority of the books that you had ordered for your Institution have been received in a damaged condition. Draft a suitable complaint cum claim letter asking for appropriate compensation from the supplier. (Use complete block form) [6]

Q4 a) Identify the barrier: [2]

(i) A signboard "fine for parking".

(ii) The rural people did not understand her speech on cleanliness

b) 'Silence is more eloquent than words' Explain. [4]

c) Match the following [4]

Caution	Instrument to see minute objects clearly
Warning	Instrument used for increasing voice volume
Microphone	Wear slippers while changing a fuse wire
Microscope	Donot overload machine beyond a prescribed capacity

.

Q5 a) Write short notes on i) Haptics ii) conciseness [4]

b) Differentiate between hearing and listening . [2]

c) .Give a diagrammatic representation of a letter in complete block form [2]

d) Make sentence with the following pair of words so as to differentiate between their meanings:

i) access- excess ii) sail –cell [2]

Q6 **Read the following passage and answer the questions that follow:** [5]

It is reported that the government is close to finalizing a system of dual pricing for the public procurement of food grains. There would be two basic elements to this system: A fixed Minimum Support Price (MSP) covering the cost of cultivation, as at present, recommended by the Commission on Agricultural Costs and Prices (CACP), and variable procurement prices, at the discretion of the department of food , depending on market For example, according to a working group of the Planning Commission, over the five year period ending 2001-02 when there was a steep rise in procurement price resulting in accumulation of embarrassing large stock of food grains of over 60 million tones with the government, consumption of food grains in the country was reduced, on this account, by at least five million tons per annum. The new system by assigning a greater role for private trade can improve the efficiency in the distribution of foodgrains and substantially cut down subsidies, which can help to step up much needed public investment in agriculture. The proposed dual pricing system is a better alternative than total marketisation of foodgrains trade by disbanding altogether public procurement at MSP.

Such a dismantling could lead to a crash in market prices of foodgrains in years of food harvest. Even though this may take exports competitive and raise domestic consumption of food grains in the short run, it may undermine food security by sapping producer incentives. The experience of green revolution underlines the importance of assured MSP including the farmers to step up their own investment and effort and derive full benefit from available infrastructure.

For the dual pricing system to yield desired results, it needs to be backed by several other policy measures. Since the impetus for crop diversification would be greater in the infrastructurally developed regions like the north-west , this can slow down the growth of foodgrains output in the country and, in particular, the surpluses procured, unless immediate

measures are taken to strengthen public support for irrigation, technology, extension and credit in the rest of the company, especially in the central and eastern regions where there is a large potentials the growth of food grains output has barely kept pace with population growth since the mid-90s. This also calls for more effective public procurement of food grains at MSP in these regions, as farmers have to often sell their produce immediately after the harvest at prices that are lower than MSP. Therefore, dual pricing system can be sustained only through non-price interventions such as infrastructural support for regional dispersal of growth in foodgrains output.

The new system requires better market intelligence forecasts as well as concurrent analyses on prices and sales in markets in India and abroad

Questions.

(a) What are the two elements of dual pricing system for procuring foodgrains?
(b) How will the above proposed system benefit the nation?
(c) What is the result of ecological degradation in the north-western region of India ?
(d) In order to boost the dual system what urgent measures are needed to be taken?
(e) How we can sustain the dual pricing system?

b) Describe any ONE of the following objects giving definition, diagram, components & working.

Electronic Voting Machine, Digital camera [3]

c) Use one word for the following statements. [2]

1. Words which have the same meaning,
2. A person with a positive approach
