FE-All/Choice Base - Sem II

Structured Programming Approach

31/5/2018

Q. P. Code: 40231

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

$1 + 2^2 + 3^3 + \ldots + n^n$

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

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FE- Choice Based – Sem II – Engineering Drawing

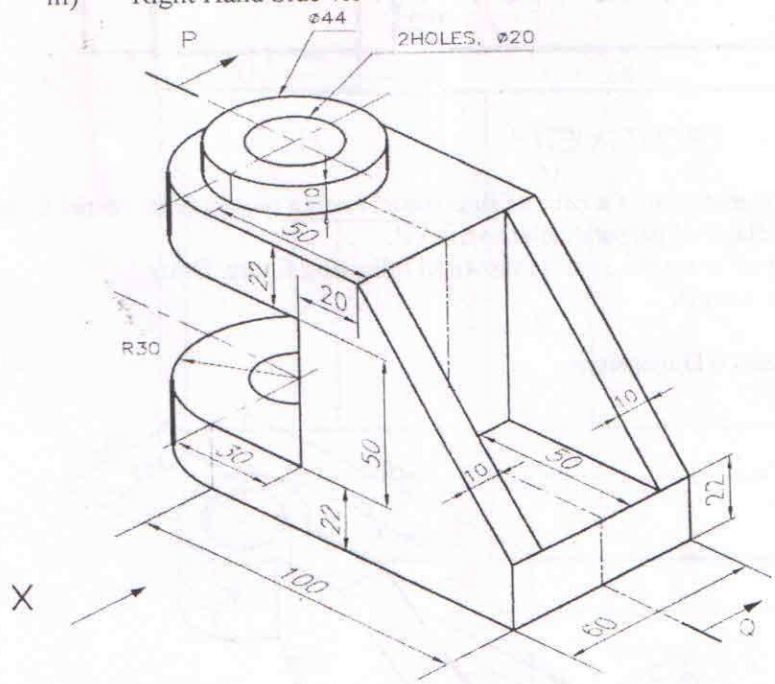
12/5/18

QP CODE : 21664

(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]

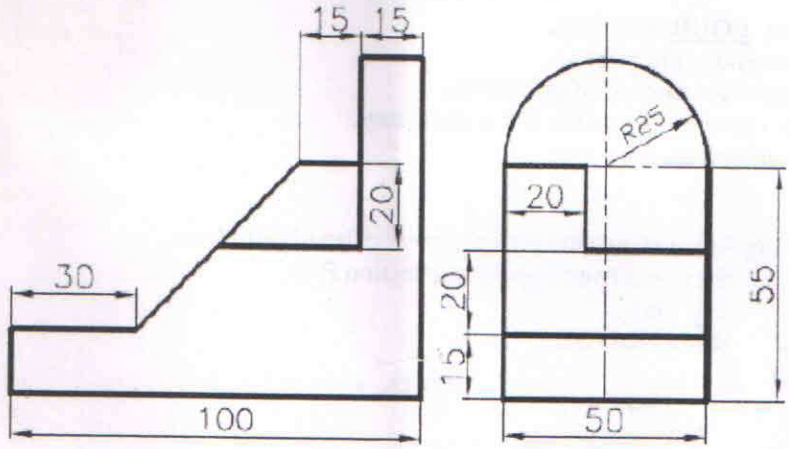


iv) Insert 10 major dimensions [2]

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]

[TURN OVER

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



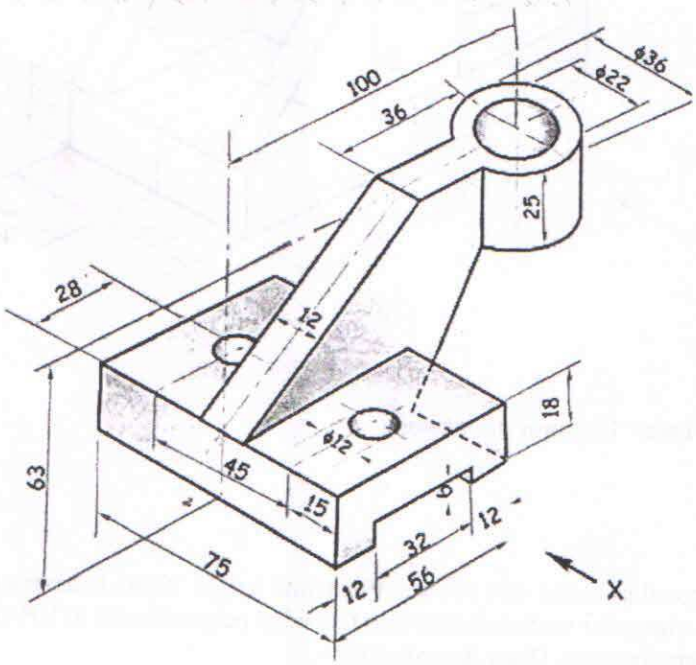
(b) Draw the elevation and plan of a cube of side 50mm resting on one of its corner of base on HP with solid diagonal perpendicular to the VP. [7]

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]



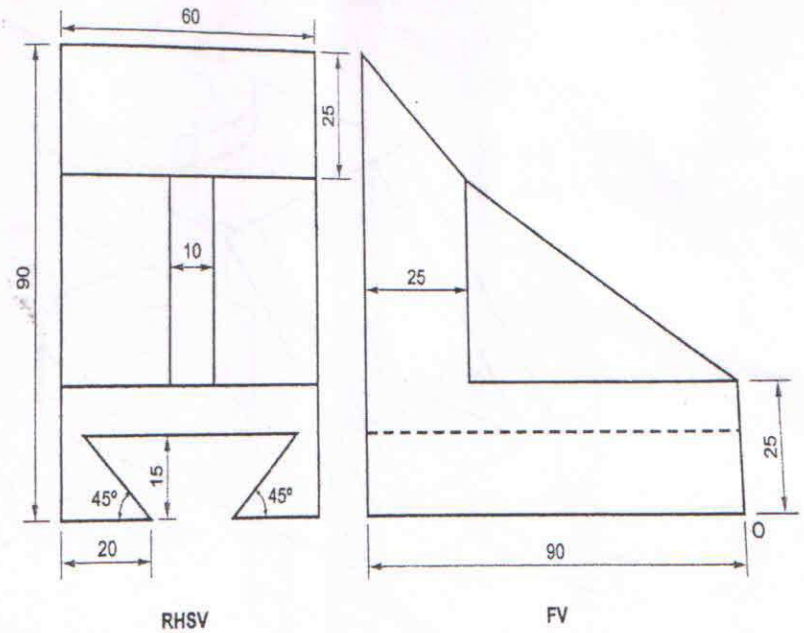
(b) Draw 1.5 revolution of a cylindrical helix of pitch 60mm on a cylinder of 50mm diameter. [6]

[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]**



FE - Sem II - CBGS - Eng. Drawing
12/6/18

Q. P. Code : 50062

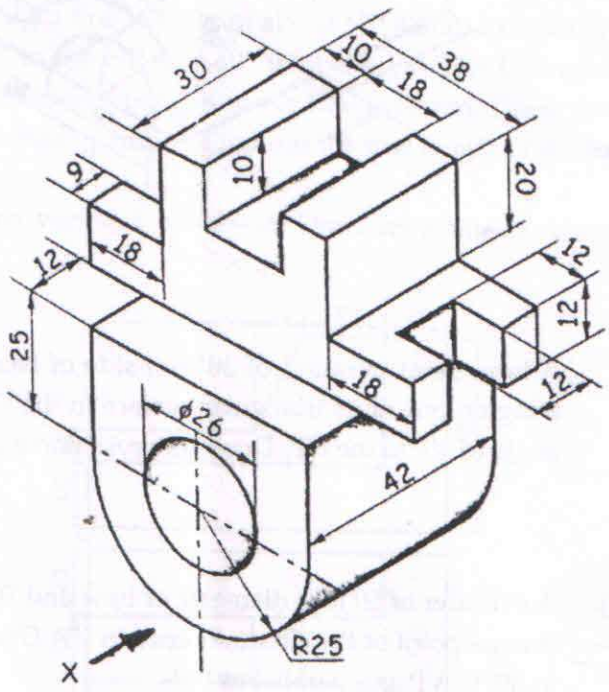
(3 Hours)

[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

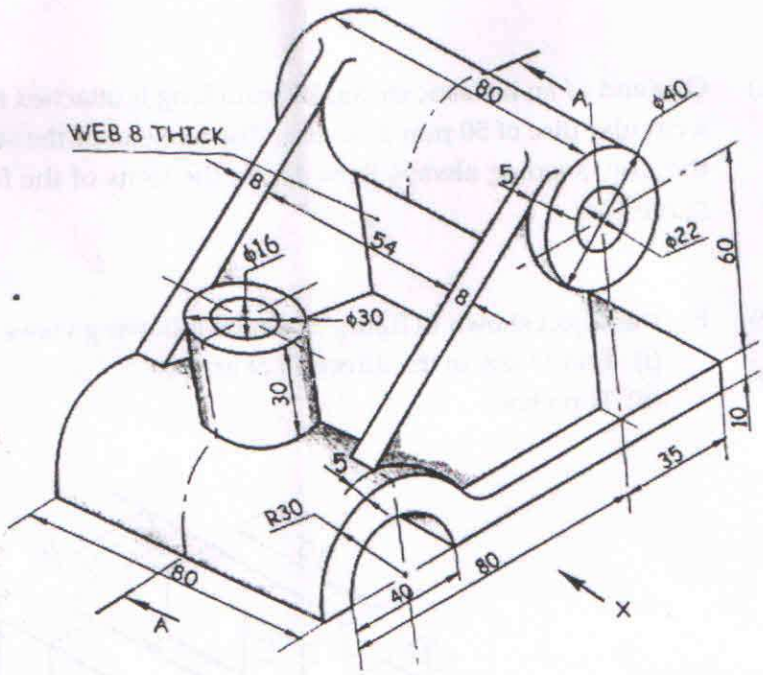
Q. 2 For the object shown in figure draw the following views –

(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)*



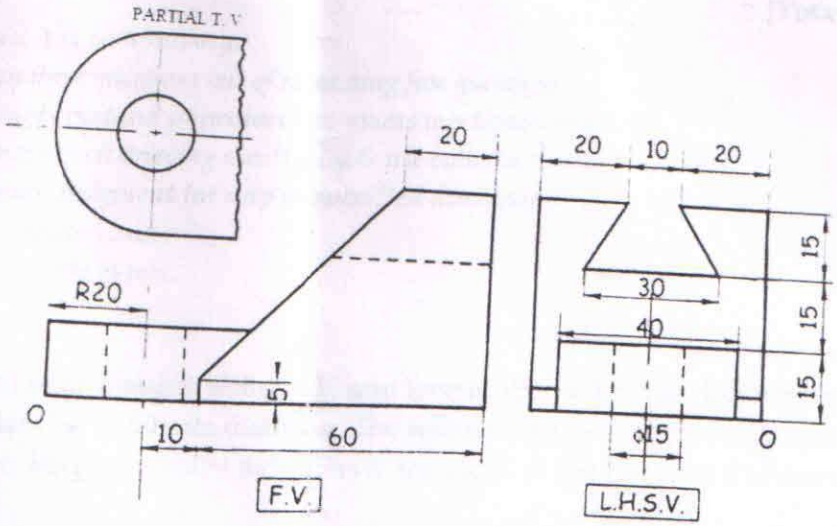
Q. 3 A hexagonal pyramid of 30 mm side of base and slant edges 65 mm long is lying on one of its triangular surface in the VP, so that its axis is inclined at an angle of 45^0 to the HP, Draw its projection if apex is nearer to the observer. *(15)*

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

8463BEBB1C5F90DFF79EFBBFAB58D2E8

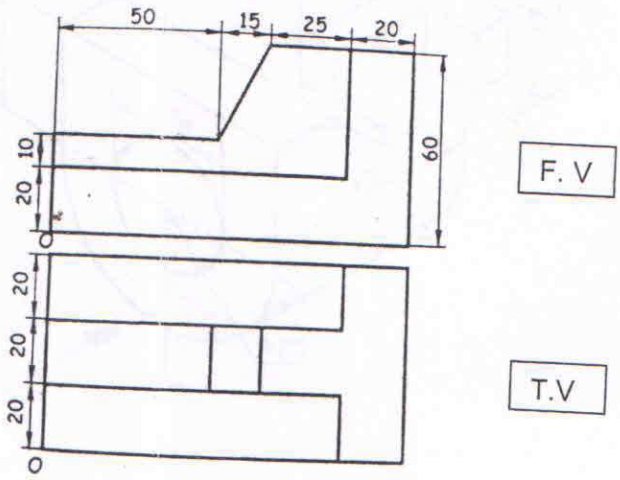
Q. 4 (b) Figure shows three views of an object. Draw its isometric view with 'O' as origin. *(09)*



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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F. E. Sem II (Choice Based)
Applied Physics II

21/05/2018

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 $(3\vec{i}+4\vec{j}+\vec{k})$.

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 5×10^{-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 $\vec{F}= x^2yz\vec{i} + xz\vec{j}$ **(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)

FE Sem II Choice Based
All Branches
Applied chemistry II

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 H_2SO_4 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.

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. 06
[Given: Mol. Wt. of an air =28.949kg]

(b) i) List the three main constituents of paint and give functions of each. 04

ii) Explain the effect of the following alloying element: on steel. 03

a) Chromium b)Tungsten

(c) Explain conventional and Green chemistry route for production of Ibuprofen Highlight the green chemistry principle involved. 02

Q.6 (a) Write short notes on:- 04

a)Computing b) Sintering

(b) i) What are Fiber Reinforced composite 06

ii) Explain how areas of anode and cathode effect the rate of corrosion 03

(c) Explain the determination of % moisture and % volatile matter in a coal sample. 02 04

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S.P.I.T Exam <exam@spit.ac.in>

Correction in Program code : T0132 - F.E.(ALL BRANCHES) (Choice Base) SEMESTER - II / T50012A - Applied Chemistry- II.\tQ.P code : 13176

1 message

University of Mumbai <support@muapps.in>
Reply-To: University of Mumbai <support@muapps.in>
To: exam@spit.ac.in

Fri, May 25, 2018 at 11:57 AM

University of Mumbai

Correction in Program code : T0132 - F.E.(ALL BRANCHES) (Choice Base) **SEMESTER - II / T50012A - Applied Chemistry- II. Q.P code : 13176**

Q. 3. c)Change evonomy to economy

Q.6. a) a) Change Computing to compacting

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Mon-Fri, 10am - 5pm

FE Sem II (CBSGS) All Branches

Applied Chemistry II

Q.P. Code :38691

[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**
      $C_6H_6 + CH_3Cl \xrightarrow{AlCl_3} C_6H_5CH_3 + HCl$
      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**

Turn Over

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**
