G - 1028 (Pages : 02) SEM 2 - 4 (RC 07 - 08)

[Total No. of Questions : 8]

F.E. (Semester - II) (Revised in 2007-08) Examination, May/June 2011
BASIC MECHANICAL ENGINEERING

Duration : 3 Hours **Total Marks : 100**

Instructions : 1) Answer five questions, selecting one from each module.
2) Illustrate your answers with neat sketches if required.

MODULE - I

Q1) a) Define a thermodynamic system and state it's characteristics. [6]

b) 1 kg of an ideal gas with $\gamma = 1.4$, initially at 300 K and 1 bar is compressed reversibly and adiabatically to 6 bar and then it is cooled at constant pressure to the original temperature.

The gas is then restored to the initial state through an isothermal process. Calculate the net work and heat interaction. [8]

c) With the help of a P-V diagram, describe the various processes that constitute the air standard otto cycle. [6]

Q2) a) With the help of a P-V diagram, describe the various processes that constitute the air standard diesel cycle. [6]

b) In an air standard otto cycle, the conditions of air at the start of the compression stroke are 1 bar and 300 K. The maximum pressure and temperature in the cycle are 70 bar and 2500 K, respectively. Calculate the compression ratio and thermal efficiency of the cycle. [8]

c) Explain how it is possible to compare the thermal state of several bodies by making use of the zeroth law of thermodynamics. [6]

MODULE - II

Q3) a) Explain the working of fuel and Ignition systems in an Internal Combustion Engine. [8]

b) With a neat sketch, explain the working of a thermal power plant. [6]

c) Write a short note on domestic Refrigerator. [6]

Q4) a) Define the following terms : [6]

i) Refrigerant.
ii) Dryness fraction.
iii) Ton of refrigeration.

P.T.O.

b) Compare 2 stroke and 4 stroke petrol engines. [6]

c) Describe the Basic Rankine cycle with the help of P-V diagram. [8]

MODULE - III

Q5) a) Describe the power brake system with a neat sketch. [8]

b) With a neat sketch, describe the working of universal joint. [6]

c) How do you classify automobiles? [6]

Q6) a) With a neat sketch, describe the various components of automobile steering system. [8]

b) Describe the working principle of a single plate clutch. [4]

c) Describe the construction and working of a constant Mesh Gear Box. [8]

MODULE - IV

Q7) a) Describe the hydrostatic extrusion process with a neat sketch. [6]

b) With a neat sketch, describe the laser beam welding process. [6]

c) Sketch a sand mould and name it's principal parts. [8]

Q8) a) Briefly explain the principle of rolling with a neat sketch. [5]

b) With a neat sketch, describe closed die forging processes. [6]

c) What are the typical applications of soldering. [4]

d) List the operations that can be carried out on a lathe. [5]

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SEM 2 – 3 (RC 07-08)

F.E. (Semester – II) Examination, May/June 2010
INFORMATION TECHNOLOGY (RC in 2007-08)

Duration : 3 Hours Total Marks : 100

Instructions : *i) Answer **five** questions with at least **one** question from **each** Module.*
*ii) **Assume** necessary data.*
*iii) Diagrams in **Pencil only**.*

MODULE – I

1. a) Explain central processing unit of a computer. 4

   b) Explain the following : 3

   1) Hard-disk
   2) Floppy-disk
   3) Optical-disk

   c) What are the different types of mice ? 3

   d) Describe the following characteristics of a monitor. 5

   a) Size
   b) Resolution
   c) Refresh rate
   d) Dot-pitch
   e) Convergence

   e) Define and explain operating systems. 5

2. a) How does operating system help in Data and Input/Output Management ? 5

   b) What is network architecture ? Explain the two architectures. 4

   c) Explain with a diagram how a e-mail works. 8

   d) Explain spamming. 3

P.T.O.

MODULE – II

3. a) Explain briefly any four database models. **8**

   b) Describe with a diagram the different steps involved in the compilation process. **8**

   c) Write an algorithm to find largest of two numbers. **4**

4. a) Explain High-level languages. Differentiate between third generation and fourth generation high level languages. **8**

   b) Differentiate between assembly level languages and high level languages. **4**

   c) Write an algorithm and draw a flowchart to find sum of the series $1^2 + 2^2 + 3^2 + ... + n^2$. **8**

MODULE – III

5. a) Explain the basic structure of a C program with an example. **8**

   b) What does a C character set consists of ? **4**

   c) Illustrate with an example the type, definition, feature present in C programming language. **4**

   d) Arrange the following operators in the decreasing order of precedence : **4**

      1) Relational operators
      2) Comma operators
      3) Function call
      4) Logical negation operator.

6. a) Explain formatted input. **5**

   b) Write a C program to find sum of numbers from 1 to N that are divisible by 5. **6**

   c) Find and explain the output of the following program : **(2×2=4)**

i)
```
# include <stdio.h>
void main ( )
  {
    int i;
    printf ("Hello");
    for (i = 1; i < = 10; i ++)
    main ( ) ;
  }
```

ii)
```
# include <stdio.h>
# include <conio.h>
void main
{
    int a[2] [2] = {{2}, {3}};
    Clrscr ( ) ;
    Printf ("%d", a[0] [0]);
    Printf ("%d", a[0] [1]);
    Printf ("%d", a [1] [0]);
    Printf ("%d", a[1] [1]);
    getch ( ) ;
}
```

d) Identify errors if any in the following code. 3

i)
```
#include <stdio.h>
void main ( )
 {
  enum fruits {apple, orange. mango};
  enum color (orange, red, pink);
  enum fruits f ;
  enum color c;
  f = apple ;
  c = pink;
  printf ("%d", f);
  printf ("%c", c);
 }
```

ii) 2
```
#include <stdio.h>
void main ( )
 {
  int num;
  printf ("Enter a number 1 n");
  scanf ("%d", & num);
  num = 1 ? printf ("The number entered is 1");
            printf ("The number entered is not 1");
 }
```

MODULE – IV

7. a) Explain with an example the three elements of a user-defined functions. 6

b) Differentiate with an example between call by value and call by reference. 8

c) Write short note on : 6

1) Static variable
2) Automatic variable
3) Register variable

8. a) Write a C program using functions to calculate standard deviation of an array of values given by the formula std. Dev $= \sqrt{\frac{1}{n}\sum_{i=1}^{n}(\bar{x} - x_i)^2}$ **10**

where $\bar{x}$ is the mean.

b) Define 2-D array with an example. **5**

c) Explain the following file Input/Output operations : **5**

a) fopen ( )

b) getc ( )

c) putwc ( )

d) fseek ( )

e) rewind ( )
