**R16**

**SET - 1**

**I B. Tech I Semester Supplementary Examinations, May - 2017**
**APPLIED PHYSICS**
(Agricultural Engineering)

Time: 3 hours                                                                                          Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**

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## PART –A

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|---|---|---|---|
| 1. | a) | Explain the concept of coherence. | (2M) |
| | b) | What are the differences between interference and diffraction? | (2M) |
| | c) | What are the special characteristics of Lasers/ light? | (2M) |
| | d) | Mention the methods of production of Ultrasonics. | (2M) |
| | e) | Write the differences between Nuclear fusion and Nuclear fission. | (2M) |
| | f) | Write any two applications of ferromagnetic materials. | (2M) |
| | g) | Explain the statement: lattice + basis = crystal structure. | (2M) |

## PART –B

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|---|---|---|---|
| 2. | a) | Explain the construction and working principle of Michelson's interferometer. | (12M) |
| | b) | What type of fringes will be formed if white light is used in a Michelson's interferometer? | (2M) |
| | | | |
| 3. | a) | Explain following the terms<br>i) Diffraction Grating      ii)  Telescope | (10M) |
| | b) | Explain the Fraunhofer diffraction due to single slit. | (4M) |
| | | | |
| 4. | a) | Explain the construction and working of He-Ne laser with neat energy fuel diagram. | (10M) |
| | b) | Write notes on half wave plate. | (4M) |
| | | | |
| 5. | a) | What is NDT? Explain any two different scan displays in common use. | (10M) |
| | b) | Explain the Sabine's formula. | (4M) |
| | | | |
| 6. | a) | Illustrate Bravais Lattices. | (10M) |
| | b) | Describe the construction of nuclear reactor. | (4M) |
| | | | |
| 7. | a) | Explain in detail the classification of magnetic materials on the basis of field and temperature. | ( 10M) |
| | b) | Derive clausius Mosotti equation. | (4M) |

1 of 1

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**I B. Tech I Semester Supplementary Examinations, April/May - 2017**
**ENGINEERING MECHANICS**
(Com. to CE, EEE, ME, CHEM, BOT, AE, AME, MTE, MM, PE, PCE)

Time: 3 hours                        Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
       2. Answering the question in Part-A is Compulsory
       3. Answer any **FOUR** Questions from **Part-B**

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## PART –A

1.  a) State and prove principle of transmissibility of forces.     (2M)
    b) Define a Free Body Diagram. Give two examples.     (2M)
    c) Define centriod and centre of gravity, with examples.     (2M)
    d) Find the product of inertia of a rectangle of sides **a** and **b** with respect to the axes     (2M)
       that lie along its two sides.
    e) A particle of mass m moves rectilinearly under the action of a force $F = F_0 \, sin\, \omega t$     (3M)
       Determine the displacement-time equation, assuming initial displacement and
       velocity are zeros.
    f) The maximum range of a projectile is 2000 m. What should be the angle of     (3M)
       elevation so as to obtain a range of 1400 m if the initial velocity remains
       unchanged?

## PART –B

2.  a) Two smooth circular cylinders, each of weight W= 1000N and radius 15cm,     (8M)
       connected at their centres by a string AB of length 40 cm and rest upon a
       horizontal plane supporting above them a third cylinder of weight 2000N and
       radius 15cm as shown in fig. below. Find the force in string AB and the pressure
       produced on the floor at the points of contact D and E.
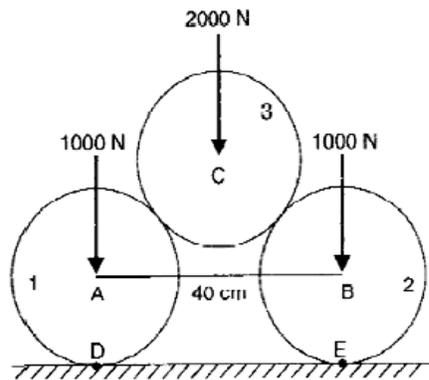


    b) A body weighing 20N is projected up a $20^0$ inclined plane with a velocity of 12     (6M)
       m/s, coefficient of friction is 0.15. Find the maximum distance S that the body
       will move up the inclined plane.

**Pages 1 of 3**

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3.    A vertical mast AB is supported in a ball and socket joint at A and by cables BC    (14M)
      and DE as shown below. A force $F = 500 i + 400 j - 300 k$ is applied at B.
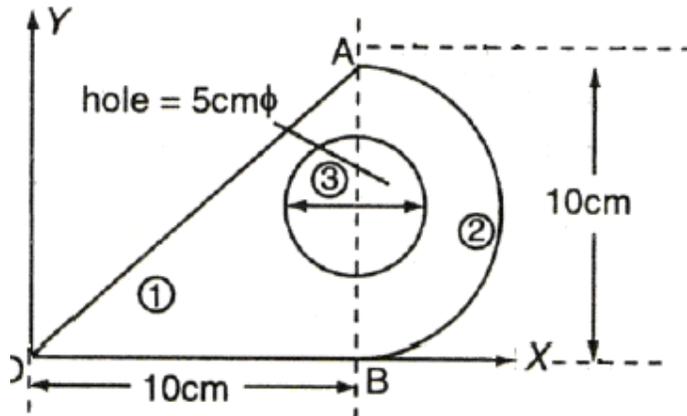      Calculate the reaction provided by the ground at A.
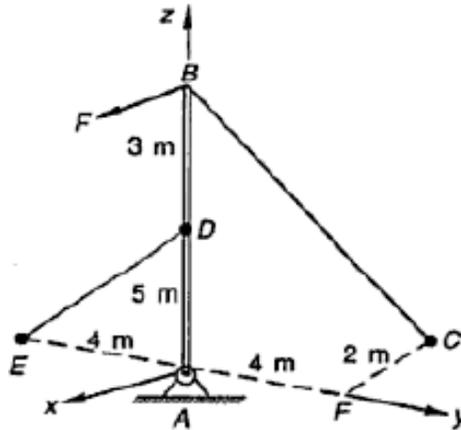


4.  a)  Locate the centroid for the shaded area as shown in below Figure. All dimensions    (7M)
        are in mm.
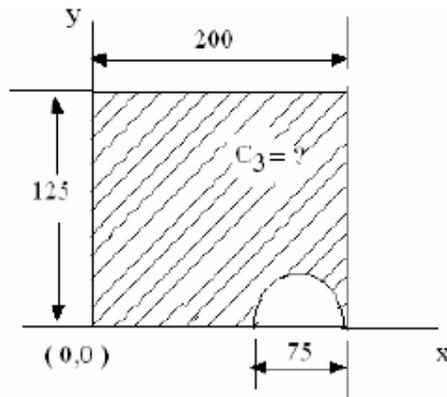


    b)  Find the centroid of a quarter circular line from basic principles.                 (7M)

**Pages 2 of 3**

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5. a) Determine the moment of inertia for the area given below about axis AB. (7M)



b) From basic principles find the moment of inertia of a solid disc. (7M)

6. A solid cylinder weighing 1200 N is acted upon by a force P horizontally as (14M) shown in figure below. Determine the maximum value of P for which there will be rolling without slipping. If P= 1000 N, determine the acceleration of the mass centre and the angular acceleration, given that the coefficient of static friction $\mu_s = 0.2$. And the co-efficient of kinetic friction $\mu_k = 0.15$.
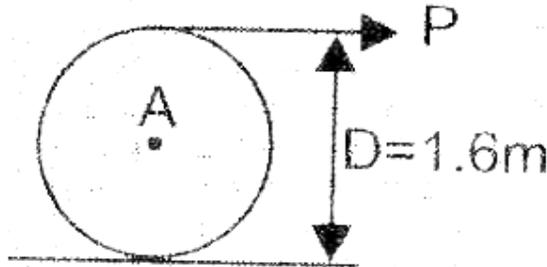


7. a) Find the tension in the string as shown in the figure below. (8M)
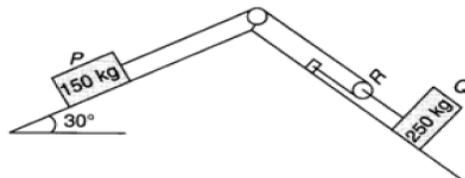


b) Derive work energy equation of translation. (6M)

**Pages 3 of 3**

**I B. Tech I Semester Supplementary Examinations May - 2017**
# COMPUTER PROGRAMMING
(Com. to CE, ME, CSE, PCE, IT, CHEM, AE, AME, MM, PE, MTE, TE)

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

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
Three Questions should be answered from **Part-B**
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## PART-A

1.  (a) How a program written in assembly language would take less computer time than the same program written in a high level language?
    (b) How do you use the function getchar() to read a complete sentence?
    (c) What is recursion? Explain with an example.
    (d) How will you represent a list of names using pointer?
    (e) What is a structure? How does it differ from an array?
    (f) Specify the modes of opening a file in C.

[4+4+3+4+3+4]

## PART- B

2.  (a) Explain the basic organization of a computer with a neat diagram.
    (b) Define a variable. How is it different from constant? Explain various types of constants in C.                                                                                                        [8+8]

3.  (a) Differentiate entry and exit checked conditional constructs with an example.
    (b) Write a C Program to find the length of a string without using built-in function.     [8+8]

4.  (a) What is a storage class? List and explain with an example.
    (b) Write a C program to find the average of n numbers using functions.                    [8+8]

5.  (a) What do you understand by pointer to pointer? Discuss its advantages and disadvantages.
    (b) Write a C program to swap two numbers using call by pointers method.                  [8+8]

6.  (a) Define and declare a structure to store date which includes day, month and year.
    (b) How structures can be passed as parameters to functions? Explain with an example.   [8+8]

7.  (a) Explain the operations that can be performed on files with suitable examples.
    (b) Write a C program to read and display a text from the file.                           [8+8]