ADAMAS UNIVERSITY
SCHOOL OF ENGINEERING AND TECHNOLOGY
END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: B.Tech   **Semester**: II
Stream: CE, ME, EE, ECE, BIOTECH
PAPER TITLE: Introduction to Programming   **PAPER CODE**: ECS41101
Maximum Marks: 40   **Time duration:** 3 hours
Total No of questions: 08   **Total No of Pages**: 02

Instruction for the Candidate:
1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

Answer all the Groups
Group A
Answer all the questions of the following   **5 × 1 = 5**

1.   **a)** What is the output of the following program:

```
main ()
{
        int sum, i;
        for (i=0;i<=10; i++)
        {
                if (i%2) continue ;
                Sum=sum+i
        }
        print ("%d", sum);

}
```

b) What will be the value of i and m after executing the following code:
```
int i=5, m;
m=++i + i++;
```

c) What will be the output of the following code?
```
int i, f=1;
for( i= 1; i <=5;i++);
        f=f*i;
printf("%d", f);
```
d) Which operator is called conditional operator?
e) Which string function returns the integer value?

GROUP –B
(Short Answer Type Questions)
Answer *any three* of the following $3 \times 5 = 15$

2. a) For which purpose identifier and keyword is used in C? [2]

b) For what reason the concept of Array is introduced in programming language?
How does the type float differ from double in C language? [2+1]

3. a) What is a pointer in C? What is the purpose of comma operator in C? [3]

b) Write an algorithm to find the biggest of the given two numbers. [2]

4. a) Define structure with example? [3]

b) Indicate the difference between Array and structure. [2]

5. a) Write a function prototype which accepts an integer, a float pointer, a string. [1]

b) Write a program in C to count the number of vowels in a string. [4]

GROUP –C
(Long Answer Type Questions)
Answer *any two* of the following $2 \times 10 = 20$

6. a) What is a function? What are the function prototypes? [2+2]

c) Write a C program to find out the factorial of a number using function. [4]

d) What is the purpose of return keyword in function? [2]

7. a) When the loop is entered into infinite loop explain with example [2]

b) Write a program in C to find the even number using continue keyword. [4]

c) Write a C program to add first n terms of the series:
   1+7+12+19+28 ………………… + n terms [4]

8. a) Create a structure to specify data on student given below:
   Name, Roll No., department, course. Using this, declare an array of 5o elements. Write a
   C program to read details of n students and print the list of students. [6]

OR

Why **for loop** is called fixed iteration and **while loop** is called unfixed iteration explain with an
Example?

b) What is the use of sizeof () operator. [2]

c) Define Machine language and High level language. [2]

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Name of the Program: B.Tech   Semester: II   Stream: ME/CE/CSE/EE/ECE/Biotechnology
PAPER TITLE: **Engineering Mechanics**   PAPER CODE: EME41102
Maximum Marks: 40   Time duration: 3 Hours
Total No of questions: 09   Total No of Pages: 02

Instruction to the Candidate:
1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

Group– A *(Question no. 1 is compulsory.)*

1. **Answer all the Five Questions** $(5 \times 1\ Marks = 5\ Marks)$

    (i)   Find out the moment of inertia of rectangular section 3 cm wide and 4 cm deep about X-X axis.
    (ii)   If the resultant of two equal forces has the same magnitude as either of the forces, then what is the angle between the two forces?
    (iii)   State Lami's Theorem.
    (iv)   What is the expression of the moment of inertia of a triangular section of base (b) and height (h) about an axis through its CG.
    (v)   What is angle of repose?

Group– B
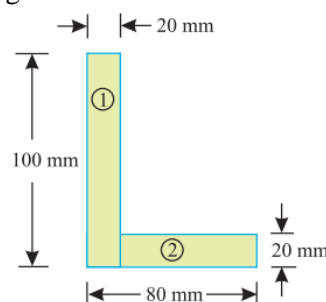### Answer any *three* questions $(3 \times 5\ Marks = 15\ Marks)$

2. Explain:
(a) Varignon's principle of moments   (2.5X2)
(b) Polygon law of forces

3. Determine the centroidal position of triangular section whose base is 'B' and height is 'H'.   (5)
4. Find the centroid of an unequal angle section 100 mm × 80 mm × 20 mm.   (5)

5. An electric light fixture weighting 15 N hangs from a point C, by two strings AC and BC. The string AC is inclined at 60° to the horizontal and BC at 45° to the horizontal as shown in Figure. Using Lami's theorem, determine the forces in the string's AC and BC.   (5)
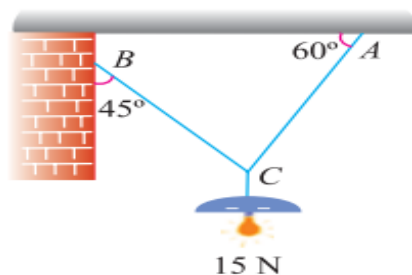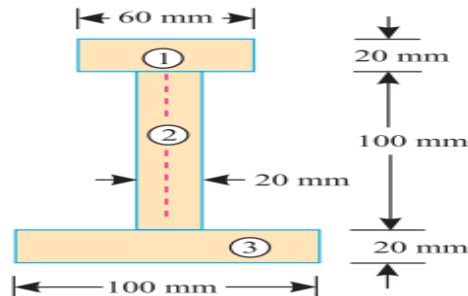
7. (a) Explain principle of transmissibility? (3)
   (b)Find out the reaction forces at support as shown in figure below using principle of virtual work.(7)
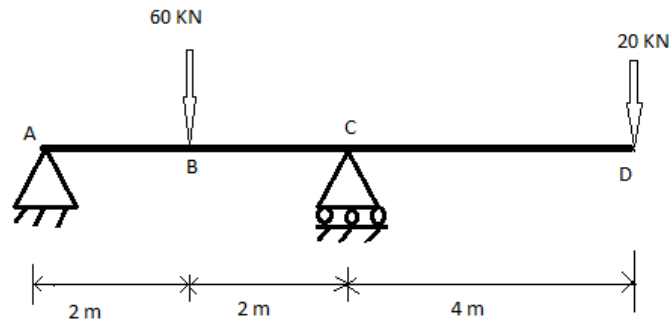
8. (a) Derive perpendicular axis theorem of moment of inertia. (3)
   (b) An I-section is made up of three rectangles as shown in Figure below. Find themoment of inertia of the section about the horizontal axis. (7)

9. (a)Explain Laws of Coulomb's friction? (3)
   (b) An effort of 200 N is required just to move a certain body up an inclined plane of angle 15° the force acting parallel to the plane. If the angle of inclination of the plane is made 20° the effort required, again applied parallel to the plane, is found to be 230 N. Find the weight of the body and the coefficient of friction. (7)

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END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: B. Tech/ BCA/MCA   Semester: II
Stream: CSE/ECE/EE/ME/CE/Biotech
PAPER TITLE: Engineering Ethics, Values and the Laws   PAPER CODE: HEN41119
Maximum Marks: 40   Time duration: 3 hours
Total No of questions: 08   Total No of Pages: 02

Instruction for the Candidate:
1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

Answer all the Groups
Group A
Answer all the questions of the following   **5 × 1 = 5**

1. **a)** The punishment for subsequent conviction for knowingly infringing or abetting infringement of copyright work is …………………………
   b) The two types of traditional forms of cyber-crimes are……………………. and ……………
   c) "Phising" is ………………… form of cyber-crime.
   d) An agreement enforceable by law is …………..
   e) The punishment of intentionally selling goods or providing services to which false trademark or false trade description is applied is………………

GROUP –B
(Short Answer Type Questions)
Answer *any three* of the following   **3 × 5 = 15**

2. Write a Short Note on IEEE Code of Ethics.
3. Elaborate the directive principles of State Policy.
4. Name the agencies of cyber security.
5. Write a Short Note on "Piracy".

GROUP –C
(Long Answer Type Questions)
Answer *any two* of the following   **2 × 10 = 20**

6. Decide the following cases:
   a. A's wife got abdominal pain. The doctor advised that this was to be operated for appendicitis to which 'A' and his wife reluctantly agreed. The patient was put under chloroform anesthasia. On incision, the appendix was found to be normal. The doctor then made another incision and removed the gall bladder of the patient without taking 'A's' consent, although he was waiting outside the operation theatre. The liver and kidney of the patient which were already damaged, had been further damaged due to the toxic effects of the chloroform and as a result, the patient died on the third day of the operation.
   b. The victim was resting her elbow on the window sill. A truck coming from the opposite direction hit her in her elbow and she received serious injuries.

c. Due to heavy rain a factory was flooded with water which got mixed with oily substance. The floors in the factory got slippery. The victim slipped and got injured. What is the liability of the factory?

d. A child visits zoo and put his hands inside the iron bars where a tigress was kept and his hands were crushed by the tigress.

e. A bus conductor invites passengers to travel on the roof of the bus and one of the passengers travelling on the roof is hit by the branch of a tree and falls down and gets killed after the driver swerves the bus to the right to overtake a cart.

7. Discuss the rights of engineers.
8. Describe how sustainable engineering can be beneficial to society.

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END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: B. Tech   Semester: II
Stream: CSE/ECE/EE/ME/CE/Biotech
PAPER TITLE: Engineering Mathematics-II   PAPER CODE: SMA41102
Maximum Marks: 40   Time duration: 3 hours
Total No of questions: 08   Total No of Pages: 02

Instruction for the Candidate:
1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

Answer all the Groups

Group A
Answer all the questions of the following   **5 × 1 = 5**

1.   **a)** Calculate the inverse z-transform of the function $F(z) = \frac{1}{z-2}$.

b) Find the polar form of $-1 + i$.

c) What is the Laplace transform of $f(t) = t^2 e^{-at}$?

d) Write down the Fourier series representation for an odd function $f(x)$ in the interval $-\pi \le x \le \pi$.

e) If $A = \begin{pmatrix} 0 & 2 \\ 0 & 4 \end{pmatrix}$, write A as a sum of a symmetric and skew symmetric matrices.

GROUP –B
(**Short Answer Type Questions**)
Answer *any three* of the following   **3 × 5 = 15**

2.   Verify Cayley-Hamilton theorem for $A = \begin{pmatrix} 0 & 0 & 1 \\ 3 & 1 & 0 \\ -2 & 1 & 4 \end{pmatrix}$.

3.   Express $f(x) = \begin{cases} 1 & for\ 0 \le x \le \pi \\ 0 & for\ \ x > \pi \end{cases}$ as a Fourier sine integral and hence evaluate $\int_0^\infty \frac{1-\cos \pi\lambda}{\lambda} \sin \lambda x\ d\lambda$.

4.   Define Harmonic function. Prove that $H(x, y) = e^{-y} Sin\ x$ is a harmonic function.   [2+3]

5.   Find the inverse Z-transform of $F(z) = \frac{(3z^2 - z)}{(z-2)(z-3)(z-4)}$, using partial fraction method.

GROUP –C
(**Long Answer Type Questions**)
Answer *any two* of the following   **2 × 10 = 20**

6.   (i) Determine the analytic function $f(z) = u + iv$, if $u = e^x(x\ Cosy - y\ Sin\ y)$.

(ii) Evaluate the line integral $\int_i^{2-i}(3xy + iy^2)dz$ along the line $x + y = 1$ [5+5]

7.   (i) Evaluate the integration using Residue theorem $\int_c \frac{dz}{(z-1)(z-2)(z-3)}$ where $c: |z| = \frac{5}{2}$

(ii) Compute the Laplace transform of the following function $f(t) = \frac{e^{-at} - \cos bt}{t}$ [5+5]

8.   (i) Find Fourier cosine and Fourier sine transforms of the following function: [6+4]
$$f(x) = \begin{cases} x, & 0 < x < a \\ 0, & otherwise \end{cases}, \quad a \text{ is constant}$$
(ii) Construct the Fourier cosine series expansion of the function
$$f(x) = \begin{cases} 1, & 0 \le x < 1 \\ -1, & 1 < x < 2 \\ 0, & otherwise \end{cases}$$

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END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: B.Tech
Semester: II

Paper Title   : Engineering Physics   **Paper Code: SPH41109**
Maximum Marks   : 40   Time duration   : 3Hrs
Total No of questions :   Total No of Pages   :

(Any other information for the student may be mentioned here)

Group - A

Marks 5

Q. No. 1) Answer all Questions   **(1 X 5)**

I) Define Central force with example.

II) What is moment of inertia & mention it's relation with rotational kinetic energy.

III) What are scalar and vector triple products.

IV) What is dispersive power of a grating and resolving power of a prism.

V) State pointing theorem.

Group – B

(Answer any three questions)

Marks 3 X 5

Q. No. 2) State Maxwell's equation for electromagnetic fields in CGS and SI systems. What are the properties of Maxwell's Equation?   (3+2)

Q. No. 3) What is Laser. What are the differences between Laser and ordinary light? What is an optical fibre? Describe in brief the construction of an optical fibre.   (1+1+1+2)

Q. No. 4) When an electron jumps from energy level of 5.44 X 10^{-19} J to an Energy level of 2.42 X 10^{-19} J, Find the wavelength and colour of Photon. Mention a few applications of Laser & optical fibre.   (3+1+1)

Q. No. 5) Define the term Phase and epoch related to Simple Harmonic motion. Show that the motion of a liquid in a U tube will be in simple harmonic motion when a force is applied on any limb of the U tube. (1+1+3)

Group – C
(Answer any two questions)

Marks 2 X 10

Q. No. 6) What do you DE Broglie wavelength. Calculate the DE Broglie wavelength of cricket ball of mass 500 Gram moving with velocity 13.9 m/sec. What is the nature of DE Broglie wave? What is uncertainty principle? Describe the time independent Schrödinger Equation for a free particle. (1+3+1+1+4)

Q. No. 7) What are the differences between interference & diffraction of light. In a Newton's Ring experiment the diameters of 5th and 15th Dark rings are 0.336 cm and 0.590 cm respectively. If the radius of curvature of the curved surface of a Plano convex lens used be 100 cm find the wave length of the light used. Deduce an expression for the intensity pattern due to diffraction by a single slit. Also show you result graphically. (2+3+4+1)

Q. No. 8) Explain the terms Damping co-efficient and stiffness factor. Write the equation of a damped simple harmonic oscillator. Find an expression for displacement and discuss when we get oscillators of damped simple harmonic motion. Find the area of a triangle whose Base is given by $\vec{i} + \vec{j} + \vec{k}$ & one of the other two sides by $2\vec{j} + 3\vec{k}$

Define angular velocity and torque of a particle related to a circular motion. (2+4+2+2)