

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name _____

Enrollment No. _____

Jaypee Institute of Information Technology, Noida

VI Examination, Even 2022

B.Tech II Semester

Course Title: Mathematics-2

Course Code: 15B11MA211

Maximum Time: 1 Hr

Maximum Marks: 20

After pursuing the course the students will be able to:

CO1: Apply different methods for solving ordinary differential equations of second order.

CO2: Explain different tests/methods of convergence for infinite series.

CO3: Find the series solution of differential equation and use it to construct Legendre's polynomials and Bessel's functions.

CO4: Classify the partial differential equations and apply Fourier series to find their solution.

CO5: Explain Taylor's & Laurent's series expansion, singularities, residues and transformations.

CO6: Apply the concept of complex variables to solve the problems of complex differentiation and integrations.

1. Obtain the general solution of the differential equation: [CO1, 2M]

$$y'' - 2y' + 2y = e^x \cos x$$

2. Solve the following differential equation by removal of first order derivative: [CO1, 3M]

$$y'' - 4xy' + (4x^2 - 1)y = -3e^{x^2} \sin 2x$$

3. Solve the given differential equation by changing the independent variable: [CO1, 3M]

$$(\sin x)y'' - (\cos x)y' - (2\sin^3 x)y = 2\sin^3 x$$

4. Solve by method of variation of parameters: [CO1, 3M]

$$y'' - 2y' + y = e^{-x} \log x$$

5. Test the convergence of infinite series: [CO2, 1M]

$$\sum_{n=1}^{\infty} \left(\frac{1}{n} \sin \left(\frac{1}{n} \right) \right)^n$$

6. Discuss the convergence of the series: [CO2, 4M]

$$1 + \frac{2^2 x}{2!} + \frac{3^2 x^2}{3!} + \frac{4^2 x^3}{4!} + \dots$$

7. Test the following series for conditional convergence: [CO2, 2M]

$$\sum \frac{(-1)^{n-1} n}{n^2 + 1}$$

8. Find the radius and interval of convergence of the power series: [CO2, 2M]

$$1 + x + \frac{x^2}{2} + \frac{x^3}{3} + \dots$$

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Name _____

Enrolment No. _____

Jaypee Institute of Information Technology, Noida

TI Examination 2022

Semester - II

Course Title: Software Development Fundamentals- II

Max. Hours: 1Hr

Course Code: 15B11C1211

Max. Marks: 20

COURSE OUTCOMES		COGNITIVE LEVELS
CO1	Explain knowledge concepts like class and objects from their structure and operations and their use.	Understand Level (Level 2)
CO2	Apply and implement the relationships of association, aggregation, composition and inheritance.	Apply Level (Level 3)
CO3	Analyze the output of the source code and able to debug the errors.	Analyze Level (Level 4)
CO4	Design the class diagram for real life problems and implement it using virtual functions, abstract classes, templates, and exception handling.	Create Level (Level 5)
CO5	Apply SQL commands to create tables and perform various operations like insert, delete, select etc.	Apply Level (Level 3)

1. Can we overload $?$ and $+=$ operators? If yes, then overload it using an example. If no, then simply state that it cannot be overloaded. Marks [2]
CO-1
2. Write a program for developing a matrix class which can handle integer matrices of different dimensions. Also overload the operator for addition, multiplication & comparison of matrices. Marks [5]
CO-1
3. Write a Program to design a class complex to represent complex numbers. The complex class should use an external function (use it as a friend function) to add two complex numbers. The function should return an object of type complex representing the sum of two complex numbers. Marks [3]
CO-1
4. Identify the error in the following program Marks [6]=
1.5+1.5+1.5+1.5
CO-3

A.

```
#include <iostream.h>
class Item
{
    private:
    static int count;
    public:
    Item()
    {
        count++;
    }
    int getCount()
    {
        return count;
    }
    int* getCountAddress()
    {
        return count;
    }
};
int Item::count = 0;
void main()
{
    Item objItem1;
    Item objItem2;
    cout << objItem1.getCount() << '\n';
    cout << objItem2.getCount() << '\n';
    cout << objItem1.getCountAddress() << '\n';
    cout << objItem2.getCountAddress() << '\n';
}
```

B.

```
#include <iostream.h>
class Room
{
    int width;
    int height;
    public:
    void Room()
    {
        width=12;
        height=8;
    }
    Room(Room& r)
    {
        width =r.width;
        height=r.height;
        copyConsCount++;
    }
    void displayConsCount()
    {
        cout<<copyConsCount;
    }
};
int Room::copyConsCount = 0;
void main()
{
    Room objRoom1;
    Room objRoom2(objRoom1);
    Room objRoom3 = objRoom1;
    Room objRoom4;
    objRoom4 = objRoom3;
    objRoom4.displayConsCount();
}
```

C. `#include <iostream>`
`using namespace std;`
`class Space`
`{`
`int mCount;`
`public:`
`Space()`
`{`
`mCount = 0;`
`}`
`Space operator ++()`
`{`
`mCount++;`
`return Space(mCount);`
`}`
`};`
`void main()`
`{`
`Space objSpace;`
`objSpace++;`
`}`

D. `#include <iostream>`
`using namespace std;`
`class Room`
`{`
`int width, length;`
`void setValue(int w, int l)`
`{`
`width = w;`
`length = l;`
`}`
`};`
`int main()`
`{`
`Room objRoom;`
`objRoom.setValue(12, 14);`
`return 0;`
`}`

5. Find the missing lines

Marks [4]=2+2
 CO-3

A. `#include <iostream>`
`using namespace std;`
`class complex {`
`int a, b;`
`void set(int x, int y)`
`{`
`.....LINE1`
`.....LINE2`
`cout << a << " " << b << endl;`
`}`
`.....LINE3`
`complex(int a)`
`{`
`set(4, 5);`
`}`
`complex(int a, int b)`
`{`
`set(1, 2);`
`}`
`};`
`int main()`
`{`
`complex c1(10, 20), c2(20);`
`return 0;`
`}`

The output of above program is

1 2
 4 5

B. `#include <iostream>`
`using namespace std;`
`class complex {`
`int a, b;`
`public:`
`complex() {}`
`complex(int x, int y)`
`{ a = x; b = y;`
`cout << a << endl << b << endl;`
`}`
`complex(int x)`
`{ a = x; b = 0;`
`}`
`.....LINE1`
`{LINE2`
`.....LINE3`
`}`
`void show() { cout << a << endl << b;`
`};`
`int main()`
`{`
`complex c1, c2(5), c3(c2);`
`c3.show();`
`return 0;`
`}`

Output of above program is

5
 0

Name: Himanshu Dixit

Enrollment No.: 21103262

Jaypee Institute of Information Technology, Noida

TI Examination, 2022

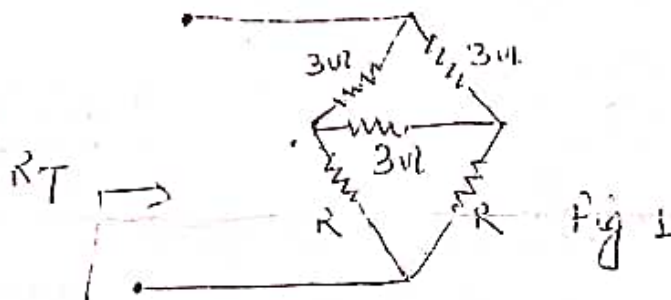
B.Tech. II Semester

Course Name: Electrical Science-I
Course Code: 15BIIEC111Maximum Marks: 20
Maximum Time: 1 hr

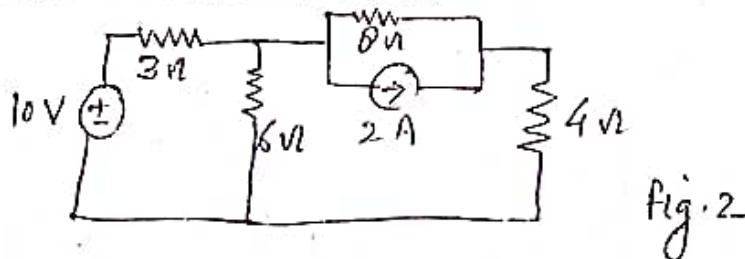
- [CO1] Recall the concepts of voltage, current, power and energy for different circuit elements, apply the Kirchhoff laws and different analyzing techniques to identify the different circuit parameters.
- [CO2] Define and apply the network theorems in the complex AC and DC circuit networks. Demonstrate the physical model for the given sinusoidal AC signal and construct the phasor diagrams.
- [CO3] Demonstrate the concept of resonance and operate different instrumental and measurement equipments.
- [CO4] Demonstrate the conception and working of single phase transformer.

Note: Attempt all the questions.

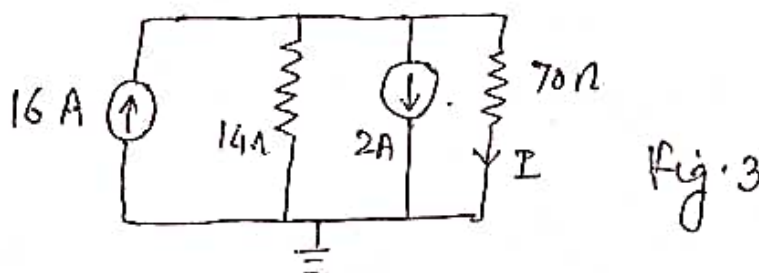
- Q1. If the equivalent resistance (R_T) of the network shown in Fig.1 is 5 ohm. Find the value of R. [3, CO1]



- Q2. Find the current across the resistor having the value of 3Ω for the circuit shown in Fig. 2 using source transformation method. [3, CO1]



- Q3. For the circuit shown in Fig. 3. Calculate current (I) and power absorbed by the 2 Amp current source. [3, CO1]



Q4. Determine the node voltages (V_1 , V_2 and V_3) for the circuit shown in Fig. 4.

[3, CO1]

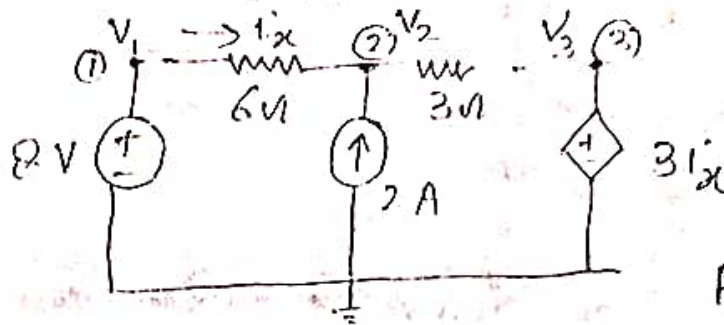


Fig. 4

Q.5 Find the current I_1 , I_2 and I_3 for circuit illustrated in Fig. 5.

[4, CO1]

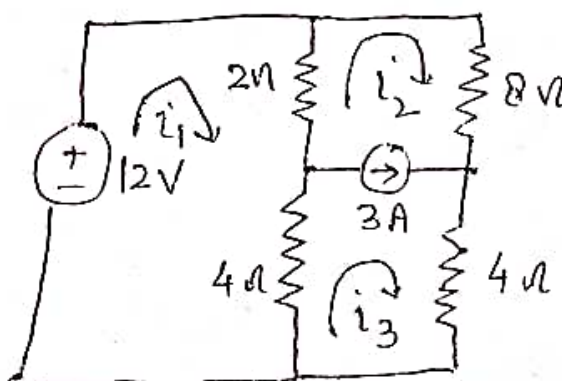


Fig. 5

Q.6 A 0.1 H Inductor has the voltage waveform as shown in Fig. 6. Find the mathematical relation for inductor current $i_L(t)$. Assuming $i_L(0) = 0$ Amp.

[4, CO1]

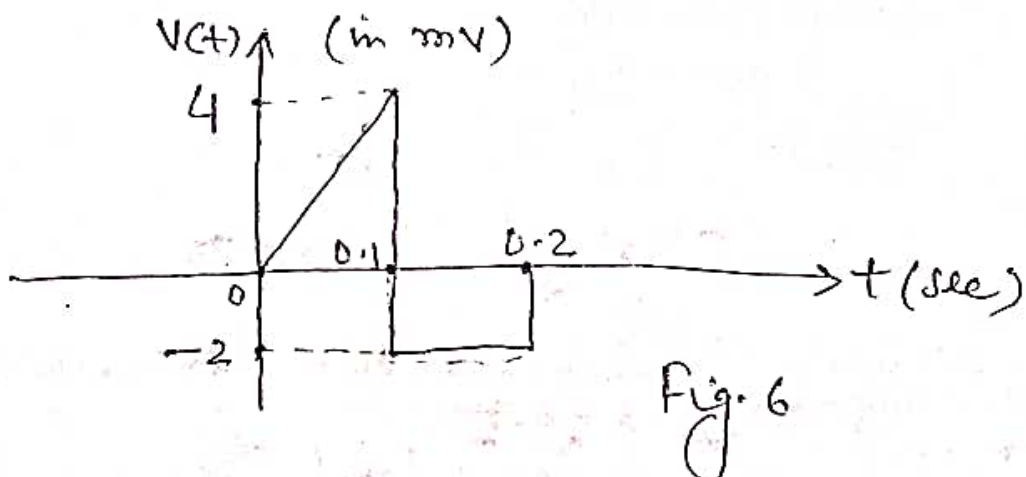


Fig. 6

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Jaypee Institute of Information Technology, Noida
 Test-1 Examination, Even 2022
 B.Tech. Course

Course Name: Physics-2
 Course Code: 15B11PH1211

Maximum Time: 1 Hr
 Maximum Marks: 20

After pursuing the course, the students will be able to

CO1: Recall the basic concepts relating to Electromagnetic theory, lasers, fiber optics and solid state physics.

CO2: Illustrate the various physical phenomena with interpretation based on the mathematical expression involved.

CO3: Apply the basic principles in solving a variety of problems related to Electromagnetic theory, lasers, fiber optics and solid state physics.

CO4: Analyze and examine the solutions of the problems using physical and mathematical concepts in the course.

Note: All questions are compulsory and answer in sequential order. Symbols have their usual meanings.

1.[CO1] (a) Find the area of the curved cylindrical surface with radius $r = 2$ m, height = 5 m and $\pi/6 \leq \phi \leq 2\pi/3$.

(b) Deduce whether the $\vec{E} = y^2\hat{i} + (2xy + z^2)\hat{j} + 2yz\hat{k}$ V/m represents an electrostatic field?

(c) In the region of space electric field $\vec{E} = 8\hat{i} + 4\hat{j} + \hat{k}$ V/m, calculate the electric flux to the surface $\vec{S} = 50\hat{j}$ m².

(d) What was the inconsistency in Ampere's circuital law and how it was modified by Maxwell?

(e) Write Maxwell's equations in differential form in free space and charge free region.

(f) Express Gauss' law in terms of potential V.

[1×6]

2.[CO2] (a) Three infinite non conducting sheets with uniform surface charge densities σ , 2σ and 3σ are arranged to be parallel to one another. Find the electric field in all regions.

(b) A radial field $\vec{H} = \frac{2.39 \times 10^6}{r} \cos \phi \hat{r}$ A/m exists in free space. Find the Magnetic flux crossing the surface defined by $-\pi/4 \leq \phi \leq \pi/4$, $0 \leq z \leq 1$ m.

(c) Use spherical coordinate system to find the area of the strip $\alpha \leq \theta \leq \beta$ on the spherical shell of radius 'a'. Calculate the area when $\alpha = 0$ and $\beta = \pi$.

[2×3]

3.[CO3] (a) Two coaxial concentric cylinders of radius a and b ($a < b$), if inner one is grounded and outer is at potential V_0 . Solve the Laplace equation to find the potential and electric field between the cylinders.

(b) Write down the Poynting theorem and explain each term.

[2.5×2]

4.[CO4] An electrostatic potential due to charge distribution is given by $V(r) = \frac{A \exp(-\lambda r)}{r}$, where A and λ are constants. Calculate the total charge enclosed with in a sphere of radius $1/\lambda$ with its origin at $r = 0$.

[3]

Constants: $\mu_0 = 4\pi \times 10^{-7}$ H/m; $\epsilon_0 = 8.852 \times 10^{-12}$ F/m; $c = 3 \times 10^8$ m/s

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Himanshu Dixit

Enrollment No. 21108262

Jaypee Institute of Information Technology, Noida

T1 Examination, 2022

B.Tech II Semester

Course Title: Life Skills and Effective Communication

Maximum Time: 1 Hr

Course Code: 22B12HS111

Maximum Marks: 20

After pursuing the course the students will be able to:

CO1: Understand different life skills required for self, family, society and lifelong success.

CO2: Apply listening, speaking, reading and writing skills in professional environment.

CO3: Develop work-place skills for personal and professional excellence.

CO4: Evaluate and make decisions for empowerment of self and others.

1. There is an increasing focus on developing comprehensive life skills in youth today so that they are empowered and are responsible citizens of society. Define what are 'life skills' and explain in detail UNICEF MENA Conceptual Framework of the 'Four Dimensions of Life Skill'. [4, CO1]

2. As a President of the Students' Union of your college, you have to deliver a speech for helping the college NSS group raise funds for poverty-stricken children of a neighbouring village. Identify the persuasive appeal/strategy that you would apply in order to attract greater number of donors and demonstrate how you would persuade the listeners for donating towards the same. [4, CO2]

3. Jackie Arnold is a veteran teacher who has enjoyed a good reputation among her peers. The principal assigned Tess to Jackie as a student teacher. Jackie asked Tess to observe a few lessons before assuming responsibility for teaching the 5th grade class. After the school one day, Jackie invited Tess for feedback. The next day, Tess offered some comments about the way Jackie organized for small-group instruction. Tess observed that Jackie's voice sounds "cranky" and that she excludes certain male students. When Tess shared her observations, Jackie became offensive.

Which tool can be applied here to improve the communication between the two? Explain and Elaborate. Suggest the quadrant that needs to be improved. [4, CO1]

4. Assume yourself to be head of Students Sports Committee. Every year your institute organizes a sports event. Your institute is funding partially for this event and so you are supposed to raise funds from sponsors. Being the head of the committee, you are required to identify and meet sponsors for this purpose and negotiate with them in order to get maximum funding. Explain the phases of negotiation process and based on the above scenario, discuss these phases. [4, CO2]

5. Briefly explain any two:

- Discuss any three features of a good debate.
- List the guidelines for effective listening.
- Discuss any two ways through which we can have positive and meaningful conversation.

[4, CO2]