Registration Number: 19BCoN38o

JECRC University, Jaipur
First In-Sem Odd Semester Examination, 2019
B.Tech. I Year, I Semester

Subject: - Applied Physics
Subject Code: - BAS010B
Time: - 1:15 Hrs. **Max. Marks: - 50**

Note: - Attempt all questions. Draw the figures wherever necessary. Write on the both sides of the answer book.

CO1: to lay the foundation of engineering education in JECRC University
CO2: to tune the engineering education with the pace of the contemporary higher education in specific
CO3: to enable student to learn and to apply concepts learnt in this subject in Industry and in real life.
CO4: to enable students to learn the idea of LASER, Holography and Optical Communication which address not only the issues of relevance to the contemporary technologies but also the futuristic scenario

Section- A [1x10=10 marks]

Q 1- Answer the following multiple choice questions. (*All questions are subjected to CO1 and CO2*)

a) The condition of orthocgonality for wave functions is defined as
(i) $\int \Psi_i^* \Psi_j d\tau = 0$ (ii) $\int \Psi_i \Psi_j d\tau = 0$ (iii) $\int \Psi_j^* \Psi_j^* d\tau = 0$ (iv) $\int \Psi_i^* \Psi_j^* d\tau = 0$

b) In Compton scattering, if the scattering angle is 180^0 then frequency of scattered photon is given by
(i) $\frac{\nu}{1+2\alpha}$ (ii) $\frac{2\nu}{1+2\alpha}$ (iii) $\frac{\nu}{h\nu+\alpha}$ (iv) None of these

c) The kinetic energy of the recoil electron in Compton effect is
(i) $E = \frac{h\nu\alpha(1-\cos\theta)}{1+\alpha(1-\cos\theta)}$ (ii) $E = \frac{2h\nu\alpha(1-\cos\theta)}{1+\alpha(1-\cos\beta)}$
(iii) $E = \frac{h\nu\alpha(1-\sin\theta)}{1+2\alpha(1-\cos\theta)}$ (iv) $E = \frac{2h\nu\alpha(1+\cos\theta)}{1+2\alpha(1+\cos\theta)}$

d) When a body of rest mass 1Kg, moves with velocity of light, its mass becomes
(i) 0 (ii) ∞ (iii) 2 Kg (iv) 1Kg

e) The rest mass of photon of energy E is
(i) E/c^2 (ii) Ec^2 (iii) Zero (iv) None of these

f) The systems, which are accelerated, are studied by .....

g) Inverse Lorentz transformation for time coordinate is. .....

h) When the Compton wavelength becomes equal to the Compton shift, then the photon scattered ..... to the direction of incident photon.

i) The wave function associated with the electron inside the infinite potential well, where V=0, will be infinite. (T/F)

j) In a rectangular potential box, if the quantum numbers are same then the particles will always have degeneracy. (T/F)

Section- B [2x4 = 8 marks]

Q 2- Answer the following questions. (*All questions are subjected to CO1 and CO2*)

a) What do you mean by Compton Shift?
b) Define inertial and non inertial frame of references.
c) What do you mean by time dilation?
d) Prove that a particle having zero rest mass is moving always with the speed of light.

Section – C

[2X6 = 12 marks]

Q 3- Answer the following Questions. (*All questions are subjected to CO1 and CO2*)

a) Calculate the relativistic energy and momentum of a proton which is moving with a speed of 2.4×10^{8} m/s.

b) Show that the value of energy which a photon must have so that it may transfer half of its energy to an electron at rest is about 256 KeV in a Compton scattering.

Section – D

[2X10 = 20 marks]

Q 4- Answer the following questions. (*All questions are subjected to CO1 and CO2*)

a) Discuss the addition of higher velocities and prove the second postulate of STR.

b) A particle, trapped in a rectangular box, is free to move three dimensionally.

i. Write down the boundary conditions for the potential and existence of wave function correspondingly.

ii. Solve the Schrodinger's wave equation and obtain energy eigen values and corresponding wave functions.

JECRC University Jaipur
Faculty of Engineering
B.Tech I Semester
I In-term Examination 2019
Paper: English (BMC120C)

Duration: 1:15 Hours

Maximum Marks: 50

Instructions:

1. All questions are compulsory.

CO1: Ability to design a language component or process to meet desired need within realistic, Constraints such as economic, environmental, social, political, ethical, scenario
CO2: Ability to analyze the usage of English words in different contexts.

Section-A (Questions 1 X 10 = 10)

Read each sentence answer as per the instruction given in bracket against it:

1. Write the titles of all the conditional sentences.
2. Use the word **well** in two different parts of speech in different sentences.
3. Someone has called me. (Change the voice of the sentence)
4. Write two negative sentences of Present Perfect Tense.
5. He came here yesterday. (Change the sentence into yes/no type question)
6. What is the difference in usage between Present Perfect Tense and Past Indefinite Tense?
7. I am working on this project since 2010. (Correct the sentence)
8. Either of this road ….(lead) to airport in this city (use correct tense)
9. Student and Play (write Parts of Speech of the underlined words)
10. I asked him why he was driving my car. (Give examples of pronouns used in the sentence)

Section-B (Questions 2 X 4 = 8)

(1) Give two examples of open conditional sentences.
(2) Write two common features of passive sentences.
(3) What is a précis? What is the importance of précis writing in technical education?
(4) Explain two use of Past Indefinite Tense.

Section-C (Questions 6 X 2 = 12)

1. Fill in the blanks with suitable form of verbs: (CO1) 06

(a) Unless you ….(mend) your ways, you will not succeed.
(b) If you had not supported me, I …(succeed) in the examination.
(c) If he were a sparrow, he …. (fly) in the sky.
(d) He …… (call) my friend for long.
(e) The bus …… (arrive) at 06.30 pm and ……. (depart) at 06.40 pm every day.
(f) I …… (have) my lunch yesterday.

2. **Change the voice of the following sentences:** 06

(a) Will she not help you?

(b) He has rejected my proposal.

(c) Why did you give him this book?

(d) Everybody speaks Hindi here.

(e) Help the poor.

(f) She looks beautiful today.

Section-D (Questions 2 X 10 = 20)

Q.1. Read the passage and answer the questions that follow: (5×2 = 10 marks) (CO1)

These days, it is not unusual to see people listening to music or using their electronic gadgets while crossing busy roads or travelling on public transports, regardless of the risks involved. I have often wondered why they take such risks : is it because they want to exude a sense of independence, or is it that they want to tell the world to stop bothering them ? Or is it that they just want to show how cool they are? Whether it is a workman or an executive, earphones have become an inseparable part of our lives, sometimes even leading to tragicomic situations. The other day, an electrician had come to our house to fix something. We told him in detail what needed to be done. But after he left, I found that the man had done almost nothing. It later turned out that he could not hear our directions clearly because he had an earphone on. Hundreds of such earphones addicts commute by the Delhi Metro every day. While one should not begrudge anyone their moments of privacy or their love for music, the fact is 'iPod oblivion' can sometimes be very dangerous. Recently, I was travelling with my wife on the Delhi Metro. Since the train was approaching the last station, there weren't too many passengers. In our compartment, other than us, there were only two women sitting cm the other side of the aisle. And then suddenly, I spotted a duffel bag. The bomb scare lasted for several minutes. Then suddenly, a youth emerged from nowhere and picked up the bag. When we tried to stop him, he looked at us, surprised. Then he took off his earpieces, lifted the bag, and told us that the bag belonged to him and that he was going to get off at the next station. We were stunned but recovered in time to ask him where he was all this while. His answer : he was in the compartment, leaning against the door totally immersed in the music. He had no clue about what was going on around him. When he got off, earplugs in his hand, we could hear strains of the song.

(i) What reasons does the author offer for the people taking risks on the road?

(ii) Why didn't the electrician carry out the work properly?

(iii) Why were the people in the Metro doubtful about the bag?

(iv) Why were the passengers stunned?

(v) Explain the term 'earphone addicts'?

Q.2. Write a précis of the passage given in question no.-1 and give it a suitable title also. (CO2) 10

JECRC University, Jaipur Set A 19 BCO

First In-Sem Examination, Sept 2019

B.Tech. 1st Year, IInd Semester

Subject: - Basic Electronics Engineering (BES001B)

Time: - 1:15 Hrs. **Max. Marks: - 50**

Instructions:

1. *Attempt all the questions.*
2. *Illustrate your answers with suitable examples and diagrams, wherever necessary.*
3. *Write relevant question numbers before writing the answer.*
4. *Please mention the correct units in all numerical questions.*

CO1-Ability to understand the physical properties of different types of semiconductors used in fabricating devices.

CO2- Ability to understand the functioning of PN junction diode and explains its main application as rectifiers and opto-electronic devices.

Q 1- Answer the following questions. **[1x10=10 marks]**

(i) [CO1]The intrinsic concentration of carriers in a semiconductor at 0K is _____.
a) 10^{19} m^{-3} b) infinity
c) zero d) none of the above

(ii) [CO2]Average current in Centre tap rectifier is _____.
a) $I_m/4$ b) $I_m/2$ c) $2I_m/\pi$ d) $I_m/2\pi$

(iii) [CO1] Germanium semiconductor material is temperature sensitive hence suffers from reliability issues.
a) True b) False

(iv) [CO1] Covalent bonds are formed due to (Sharing of electrons/Transfer of electrons)

(v) [CO2]PIV of diode in bridge rectifier is_____
a) V_m b) $V_m/2$ c) $2V_m$ d) V_m/π

(vi) [CO2]The forward resistance of p-n junction diode is greater than the reverse resistance.
a) True b) False

(vii) [CO2]What kind of a device is a diode?
a) Bilateral b) Linear c) Non-linear d) None of these

(viii) [CO1] P-type material is positively charged material.
a) True b) False

(ix) [CO2]The output frequency of a full-wave rectifier with a 60 Hz sinusoidal input is_____
a) 60 Hz b) 120 Hz
c) 30 Hz d) 240 Hz

(x) [CO2]In a semiconductor diode, the region near the *pn* junction consisting of positive and negative ions is called the _____.
a) neutral zone b) recombination region
c) Space charge region d) diffusion area

Q 2- Answer the following questions. [2x4 = 8 marks]

i) [CO1]What is the electrical neutrality equation for semiconductors?

ii) [CO2]Draw piecewise linear equivalent circuit model of p-n diode with its V-I characteristics.

iii) [CO1]Define resistivity and conductivity of semiconductors.

iv) [CO2]Define Peak Inverse Voltage

Q 3- Answer the following questions. [6x2 = 12 marks]

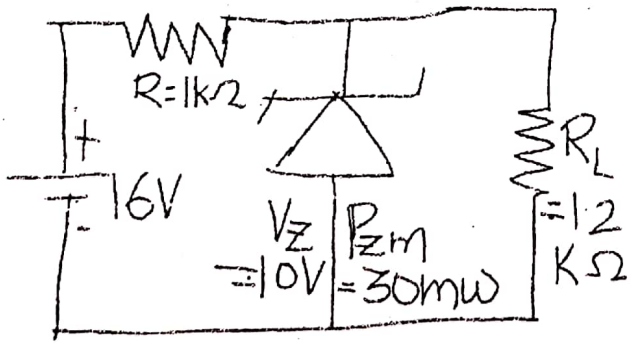
i) [CO2] A conductor material has a free electron density of 10^{24} electron per m^3 When a voltage is applied, a constant drift velocity of 1.5×10^{-2} m/sec is attained by the electrons. If the cross-sectional area of the material is $1cm^2$ calculate the magnitude of current. Electronic charge is 1.6×10^{19} coulomb.

ii) [CO2] Explain p-n junction diode and its V-I characteristics. Write briefly about Barrier voltage in p-n junction diode.

Q 4- Answer the following questions. [10x2 = 20 marks]

i) [CO2] With suitable circuit diagram and waveforms explain the operation of Full Wave Center tap Rectifier without capacitor filter. Derive V_{RMS}, V_{DC}, Ripple factor and PIV for center tap rectifier.

ii) For the Zener Diode in given figure. Determine the V_L, V_R, I_Z and P_Z also repeat the same question considering R is 3kohm in place of given value 1.2kohm



Student's Reg. No.: 19RCON380

JECRC University
First In-Sem Examination September 2019
B.Tech Ist Year(I Semester)
Subject: Computer Programming -I

Time: 1.15 hrs. **Maximum marks: 50**

Instructions:

1. *Attempt all the questions.*
2. *Illustrate your answers with suitable examples and diagrams, wherever necessary.*
3. *Write relevant question numbers before writing the answer.*
4. *Use of calculator is not allowed.*

CO1. To introduce the parts of the computer system and number system.

CO2. To describe the concepts of Boolean function and languages.

Section A (1 mark each) **10 Marks**

1.)[CO1] ..... Technology was used in Ist generation computers.
A) Vacuum Tubes B) IC
C) Transistors D) None of the above

2) [CO1] The 4 bit binary equivalent of decimal number 11 is:
A)1001 B) 1011
C) 1110 D) 1010

3) [CO1]The brain of computer is the:
A) Control unit b) ALU
C) CPU d) all of these

4)[CO2] $(101)_2 + (10)_2 = ?$
A)110 B)111
C)109 D)010

5)[CO1]ENIAC was the:
A)first generation computer B)second generation computer
c)third generation computer D)fourth generation computer

6) [CO2]Hexadecimal equivalent of $(134)_8$ is:
A)4c B)5c
C)3a D)2a

7)[CO2] EBCDIC full form is _____.

8) [CO2] 9's Complement of 357 is
A)642 B)653
C)541 D)643

9) [CO1]2's Complement of $(11100)_2$ is :

A)00011 B)00101

C)00100 D)00101

10)[CO2] ASCII code is:

A)8 bit code B)7 bit code

C)9 bit code D)none of the above

Section B (2 marks each) **8 Marks**

11. [CO1] List characteristics of Computers.
12. [CO2] Differentiate between primary and secondary memory.
13. [CO1] 1011*1001=?
14. [CO2] Write short note on ASCII Code.

Section C (6 marks each) **12 Marks**

15. [CO2] Subtract 12 from 17 using 2's complement method
16. [CO1] Explain the generations of computers state how computer in one generation are better than their predecessors.

Section D (10 marks each) **20 Marks**

17. [CO1]Draw Block Diagram of Computer and explain in detail.
18. [CO2] Convert:

a) $(127.32)_8$ to $()_{16}$

b) $(1345)_7$ to $(\ )_9$

c) $(111110011.110)_2$ to $(\ )_{16}$

d) $(1101.12)_{10}$ to $(\ )_2$

Registration No.

JECRC University, Jaipur
Ist In Sem Examination:2019
Paper: INDIAN CONSTITUTION

Time: 1.15hrs Maximum marks: 50

Instructions:
1. Attempt all the questions.
2. Illustrate your answer with suitable examples and case laws, wherever necessary.
3. Write relevant question numbers before writing the answer.

PEO 1:Students will develop themselves as effective professionals by solving real problems through the use of fundamental and advance legal knowledge and with attention to team work, effective communication, critical thinking and problem solving skills in their real life experience.
PEO 2: To understand the Indian legal system and lawyers' principal roles in that system.
PEO 3: To read, understand and use cases to construct legal arguments.
CO 1. The feeble condition of women and children and their exploitation.
CO2. The legal limitation on their capacity and legal rights and protection provided in the Constitution and in various laws are to be studied critically.

Part-A

Answer the following multiple choice questions (10*1=10marks)

1. How many writs are issued by the Supreme Court or High Court in exercise of their writ jurisdiction?
A. 5
B. 6
C. 4
D. 3

2. India is a secular country, this is mentioned in-
A. Preamble
B. Fundamental rights
C. Fundamental duties
D. Directive Principles of State Policy

3. The text of Preamble begins with-
A. I the citizen of India
B. We the citizens of India
C. We the people of India
D. We the humans of India

4.Whether the preamble is part of Indian constitution:
A. Yes
B. False

5. Republic form of Government means-
A. Where PM leads the government
B. Head of the State is Monarch
C. Head of the State is elected
D. Government is headed by President

6. The aims and objective of constitution have been enshrined in
A. preamble
B. the chapter of fundamental rights
C. the chapter of directive principles of state policy
D. all of the above

7. Which of the following justice is not mentioned in the Preamble-
A. Social
B. Economic

C. Political
D. Moral

8. Writ is issued for violation of .....
A. Fundamental Rights.
B. Legal Rights
C. Both of the above
D. None of the above.

9. Nature of Indian Constitution is
A. Unitary
B. Federal
C. Quasi Federal
D. None of the above

10. According to Indian constitution, Whether India is Socialist State or not?
A. Yes
B. No

Part B

Answer the following questions (Any four) (4*2=8 marks)

1. Define the term Preamble?
2. What do you understand by the term democracy? Whether Indian state is democratic? How?
3. Under which article of Indian Constitution Supreme Court has power to issue writs?
4. What do you mean by a federal constitution?

Part C

Answer the following questions (6*2=12marks)

1. Explain the Writ of Quo Warranto in Indian Constitution?
2. Criticially comment on the position of preamble in the Indian Constitution?

Part D

Answer the following questions (10*2=20marks)

1. Write a short note on Writs and types of writs?
2. Write a short note on feature of Indian Constitution?

Reg. No. .....

JECRC UNIVERSITY
I In-Term Examination-2019
B. Tech. - I Sem.
Subject : Engineering Mathematics-I
Code – BAS001C

Time: 1¼ hrs.
Maximum Marks: 50

Part –I **(10x1=10)**

Q. Select the correct answer of the following questions:

A1 If curve changes its nature from concave to convex on a point then that point is ----------

A2 The curve is convex at P, with respect to x-axis, if

(a) $y\frac{d^2y}{dx^2} > 0$ (b) $x\frac{d^2y}{dx^2} > 0$ (c) $y\frac{d^2y}{dx^2} < 0$ (d) None of these

A3 The intersection points of curve and its asymptotes can be given by n(n-2). (True/False)

A4 If $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = 2u$, then u(x, y) be a homogeneous function of x and y of degree 5. (True/False)

A5 f(x) $= \frac{x+y}{x^2+y^2}$ is a homogeneous function of degree _____

(a) 0 (b) -1 (c) 1 (d) none of these

A6 The radius of curvature of the parametric curves are given by

(a) $\rho = \frac{(\dot{x}^2+\dot{y}^2)^{3/2}}{\dot{x}\ddot{y}-\dot{y}\ddot{x}}$ (b) $\rho = \frac{\left(r^2+\left(\frac{dr}{d\theta}\right)^2\right)^{3/2}}{r^2+2\left(\frac{dr}{d\theta}\right)^2-r\frac{d^2r}{d\theta^2}}$

(c) $\rho = r\frac{dr}{dp}$ (d) None of these

A7 In the asymptotes, if two values of m are repeated of a curve then the value of c can be obtained by....

A8 The asymptotes of $xy^2 - a^2(x-a) = 0$ which are parallel to coordinate axis are

(a) $y = 0, y = 1$

(b) $y = a, -a, x = 0$

(c) $y = -1, y = 1$

(d) none of these

A9 If $u = e^{2xy}$, *then* $\frac{\partial^2 u}{\partial y \partial x} = \cdots$.

(a) $xe^{xy} + e^{xy}$

(b) $xe^{xy} + x^2e^{xy}$

(c) $xe^{xy} + y^2e^{xy}$

(d) none of these

A10 If u=f(x, y, z), then it's Total derivative du =.....

Part –II

(4x 2=8)

B1 Find the radius of curvature of the $x = at^2$, $y = 2at$.

B2 Find the coordinates of the centre of curvature at any point (x,y) of the curve $y = x^2$

B3 Find the values of $\frac{\partial u}{\partial x}, \frac{\partial u}{\partial y}$ *where* $u = \frac{1}{\sqrt{x^2+y^2}}$

B4 If $x^y + y^x = a^b$, then find $\frac{dy}{dx}$.

Part –III

(2x6=12)

C1 Find the maximum and minimum values of the function $f(x) = x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$.

C2 If $u = tan^{-1}\left(\frac{x^3+y^3}{x-y}\right)$, prove that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = sin2u$.

Part –IV

(2x 10=20)

D1 Show that the asymptotes of the curve $x^3 - 2y^3 + 2x^2y - xy^2 + y(x-y) + 1 = 0$ Cut the curve in three points which lie on the line $x - y + 1 = 0$.

D2 Trace the curve $y^2(a + x) = x^2(a - x)$