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B.Sc. Course (CBCS) Ordinance (Semester-V)
EXAMINATION OCTOBER 2019
Electronics: Operating System

[Duration : Two Hours]

[Max. Marks :80]

Instructions:-

- 1) All questions are compulsory.
- 2) Draw diagrams wherever necessary.
- 3) Figures to the right indicate marks.

- Q.1 Answer ANY four from the following: (4x4=16)
- i) Explain the differences between Batch systems and Time sharing systems.
 - ii) State any four reasons for process termination
 - iii) Differentiate between user level and kernel level thread.
 - iv) What are the four conditions required for deadlock to occur?
 - v) Write a short note on synchronization of message passing
 - vi) Define Micro C/OSII. What are the 2 source files in Micro C/OS –II?
- Q.2 Answer ANY four from the following: (4x4=16)
- i) What are Multiprocessor Systems? Give their advantages.
 - ii) Define a) Starvation b) Mutual Exclusion
 - iii) Define CPU scheduling. State the conditions under which CPU scheduling decisions take place.
 - iv) What is a semaphore? Explain busy waiting semaphores.
 - v) Briefly describe the Hard real time systems.
 - vi) Explain the following function calls in MicroC/OS –II
 - i) OS_ENTER_CRITICAL()
 - ii) OS_EXIT_CRITICAL()
 - iii) OSTaskStkClk()
 - iv) OSTaskChangePrio()
- Q.3 A) Define multiprogramming. Explain how multiprogramming increases CPU utilization. (6)
OR
B) What is an Operating System? What are the functions of Operating System? (6)
C) Explain in brief Process Creation and Process Termination. (6)
- Q.4 A) Explain the reasons for process suspension. (6)
OR
B) What are the four necessary conditions for deadlock prevention? (6)
C) Write a note on deadlock avoidance. (6)

- Q.5 A) State and explain the differences between preemptive and non-preemptive scheduling. (6)
OR
B) List and briefly define the classes of real time scheduling algorithms. (6)
C) Describe any 4 specifications of RTOS. Give any 4 examples of RTOS. (6)
- Q.6 A) State and explain the basic functions of a RTOS. (6)
OR
B) Write a short on MicroC/OS-II. (6)
C) Explain the steps involved in resuming a task in MicroC/OS II. (6)

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B.Sc. Course (CBCS) Ordinance (Semester-V)
EXAMINATION OCTOBER 2019
Electronics : Photonics

[Duration : Two Hours]

[Max. Marks: 60]

Instructions:-

1. All Questions are **compulsory**.
2. Draw diagrams **wherever** necessary.
3. Use of non-programmable scientific calculator is **allowed**.

Q.1 Answer **any five** of the following: (5x2=10)

- a) What is refraction and Dispersion?
- b) Write the conditions for constructive and destructive interference.
- c) State the equations for Fresnel Diffraction Integral and Fraunhofer Diffraction Integral
- d) Distinguish between Circular and elliptical polarization.
- e) Unpolarized light with an intensity of 72 w/m^2 passes through 2 polarizing filters. If the emergent light has intensity 9 w/m^2 . What is the angle between the filter.
- f) Mention two advantages of LASER over LED's.
- g) Explain the concept of P-I-N photodiode.

Q.2 Answer **any five** of the following: (5x2=10)

- a) Write a short note on total internal reflection.
- b) Calculate the wavelength of light if the slits are separated by a distance of 0.09mm and kept 150cm away from the screen on which the interference pattern is formed having a fringe width of 0.07m.
- c) Distinguish between unpolarized light and polarized light.
- d) Explain with a neat diagram how polarization occurs by reflection using Brewster Law.
- e) Write a short note on birefringent.
- f) Define Population Inversion.
- g) Name four different materials used for Light Emitting Diode.

Q.3 Answer the following: (5x2=10)

- A. Explain the interaction of a plane wave with a reflecting surface with a ray diagram.
- OR
- B. Explain Young's double slit experiment with a ray diagram.
 - C. Explain Resolving power of Telescope with a ray diagram.

Q.4 Answer the following: (5x2=10)

- A. Explain Fresnel's Diffraction with a ray diagram.
- OR

- B. i) Explain Huygens principle.
- ii) Draw a neat diagram of Cylindrical and spherical wavefronts.
- C. Explain the principle of Superposition of waves with diagrams.

Q.5 Answer the following: (5x2=10)

- A. Explain Nichol's Prism with a diagram.
- OR
- B. Explain the principle of Photomultiplier tube with a diagram.
- C. Explain the different types of retardation plates?

Q.6 Answer the following: (5x2=10)

- A. Explain the principle of Liquid Crystal Display with a diagram.
- OR
- B. Explain the construction of Light Emitting Diodes with a neat diagram.
- C. Write a short note on different types of Lasers on the basis of active medium.

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B.Sc. Course (CBCS) Ordinance (Semester-V)
EXAMINATION October 2019
Electronics - Power Electronics

[Duration : Two Hours]

[Max. Marks :80]

Instruction :

- i) All questions are compulsory.
- ii) Use of non-scientific calculator is allowed.

Q.1 Answer any 4 of the following.

(4X4=16)

- i) Write a short note on Power Diodes.
- ii) List the importance of Pulse transformer and Light activated SCR firing circuit.
- iii) Draw the structure and V-I characteristics of Triac.
- iv) List the various overvoltage conditions in power semiconductor devices. How it can be protected?
- v) Explain the effect of free wheeling diode in controlled rectifier.
- vi) Compare between IGBT and power MOSFET.

Q.2 Answer any 4 of the following:

(4X4=16)

- i) Draw the block diagram of a typical UPS system. Compare between On-line and Off-line UPS.
- ii) Explain class A (self commutation by resonating the load) forced commutation circuit.
- iii) A UPS is driving a 600W load which has a lagging power factor of 0.8. The efficiency of the inverter is 85%. The battery voltage is 24V dc. Assume that there is a separate charger for the battery. Determine the following:
 - a) KVA rating of the inverter
 - b) Wattage of the rectifier
- iv) Explain the concept of mutual inductance with a neat diagram.
- v) List the advantages of three phase system over single phase system.
- vi) Briefly, explain the construction of induction motor.

Q.3 Answer the following:

(6X2=12)

- A) With the help of two-transistor model, explain the turn-on mechanism of an SCR.

OR

- B) With the help of a diagram, explain UJT gate firing circuit for an SCR.
C) Draw and explain the single phase full wave (bridge) controlled rectifier with resistive load. Draw the load voltage and load current waveforms.

- Q.4 **Answer the following:** (6X2=12)
A) Draw and explain the switching characteristics and limitations of Power BJT.

OR

- B) Explain the working of voltage stabilizer with the help of a neat diagram.
C) With the help of circuit diagram and waveform, explain the working of series inverter.

- Q.5 **Answer the following:** (6X2=12)
A) Draw the circuit diagram of type D chopper and explain its working.

OR

- B) Draw the circuit diagram of Voltage commutated chopper and explain its working.
C) Draw the circuit diagram of a current driven inverter and explain its working.

- Q.6 **Answer the following:** (6X2=12)
A) Draw the equivalent circuit DC shunt and DC series motors and explain its speed-torque characteristics of DC series and DC shunt motors.

OR

- B) With the help of a diagram, explain thyristor based DC motor speed control.
C) With the help of a diagram, explain thyristor based speed control of AC motor.

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B.Sc. Course (CBCS) Ordinance (Semester-V)
EXAMINATION OCTOBER 2019
Electronics : Transducer & Instrumentation

[Duration : Two Hours]

[Max. Marks : 80]

Instructions:

- 1) All Questions are Compulsory.
- 2) Draw Circuit Diagrams / Block diagrams wherever necessary.
- 3) Use of Non-Programmable Calculator is allowed.

Q.1 Answer any four of the following (4x4=16)

- a) The value of a resistance is $3.6\text{ K}\Omega$, while measurements it yields a value of $3.56\text{ K}\Omega$, Calculator:
 1. % Error
 2. Relative Accuracy
- b) What is the difference between Photoconductive and Photovoltaic Transducers
- c) Mention any four features of an Instrumentation Amplifier
- d) Mention any four differences between Dual Trace and Dual Beam CROs.
- e) What are the differences between a wave analyzer and a harmonic distortion analyzer?
- f) What are the advantages of a Digital Voltmeter over Analog Voltmeter?

Q.2 Answer any four of the following (4x4=16)

- a) Mention the various types of Errors in measurement.
- b) What are the functions of a transducer?
- c) Draw the frequency response curves of various types of filters.
- d) Draw the basic diagram of a CRT and Label its various components.
- e) What is the primary use of each of the following bridge.
 1. Wheatstone's bridge
 2. Kelvins Bridge
 3. Maxwell's Bridge
 4. Wien's Bridge
- f) A $4\frac{1}{2}$ digit voltmeter is used for voltage measurements
 - 1) Find its resolution
 - 2) How would 11.43V be displayed on a 10V range.

Q.3 Answer the following (2x6=12)

A) For the following given data
Data: $x_1 = 49.7$, $x_2 = 50.1$, $x_3 = 50.2$, $x_4 = 49.6$, $x_5 = 49.7$
Calculate

- i) Arithmetic Mean
- ii) Deviation of Each Value
- iii) Average Deviation
- iv) Standard Deviation

OR

- B) Draw the construction diagram of LVDT and explain its principles of operation.
- C) Draw the schematic diagram of an Instrumentation amplifier and derive the expression for its output voltage.

Q.4 Answer the following (2x6=12)

A) What is a resistance thermometer? With a suitable diagram, explain how a resistance thermometer is used for measurement of temperature.

OR

B) With the help of neat block diagram, explain the working of Digital Storage Oscilloscope

C) Draw the circuit diagram of a Wheatstone bridge and derive the equation for balance bridge condition.

Q.5 Answer the following (2x6=12)

A) Explain the use of potentiometer for the measurement of
1. Linear displacement 2. Angular displacement 3. Rotational motion

OR

B) Draw the block diagram of a AF sine and square wave Generator and explain briefly.

C) Draw the Basic Block diagram of Oscilloscope and mention the functions of the various blocks.

Q.6 Answer the following. (2x6=12)

A) Explain the working of a Phototransistor and draw its output characteristics

OR

B) Explain with the help of a Block diagram, heterodyne wave analyzer.

C) Explain with the help of a neat block diagram the working of a staircase ramp type digital voltmeter