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**Question Paper Code: 45305**

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

Fifth Semester

Electrical and Electronics Engineering

14UEE505 - PROTECTION AND SWITCH GEAR

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Globar rod is the source of \_\_\_\_\_ spectrometer.  
(a) infrared spectrometer                      (b) mass spectrometer  
(c) UV-visible spectrometer                      (d) atomic absorption spectrometer
2. Wave number of near infrared spectrometer is  
(a) 12500 - 4000                      (b) 4000 - 200                      (c) 200 - 10                      (d) 200 - 20
3. If the concentration of solution increases, then the absorption \_\_\_\_\_  
(a) remains same                      (b) decreases                      (c) increases                      (d) unpredictable
4. \_\_\_\_\_ is the substance that carries the analyte.  
(a) Solute                      (b) Eluent                      (c) Eluate                      (d) Solvent
5. Paramagnetic oxygen analyser is a \_\_\_\_\_ kind of oxygen measurement.  
(a) physical method                      (b) chemical method  
(c) electrochemical-oxygen analyzer                      (d) analytical method
6. A large size alternator is protected against overloads by providing  
(a) over current relay                      (b) Temperature sensitive relay  
(c) Thermal relay                      (d) None of these

7. Which of the following circuit breakers has the lowest operating voltage?
- (a) SF<sub>6</sub> circuit breaker                      (b) Air break  
(c) Air blast    (d) Minimum oil circuit breaker
8. If the pH value of the solution is 5, what will be the concentration of H<sup>+</sup> ions
- (a) 10<sup>-0.2</sup> gm/lit                                      (b) 10<sup>-2</sup> gm/lit  
(c) 10<sup>-5</sup> gm/lit                                      (d) 10<sup>-5</sup> gm/lit
9. Scintillators are chemicals used to convert
- (a) chemical energy to radiant energy              (b) radiant energy to light  
(c) radiant energy to chemical energy              (d) light to radiant energy
10. Quadrupole analyzer is one type of
- (a) NMR spectrometer                              (b) X-ray spectrometer  
(c) Mass spectrometer                              (d) IR spectrometer

PART - B (5 x 2 = 10 Marks)

11. What are the sources used in UV spectrometers?
12. List out the different types of gas chromatographic detectors.
13. State the principle of working of an infra-red gas analyzer.
14. Define ion-selective electrode. List its types.
15. What is the basic principle of mass spectrometers.

PART - C (5 x 16 = 80 Marks)

16. (a) With a neat diagram explain the construction and working of single beam and double-beam UV spectrophotometer. (16)

Or

- (b) (i) Describe the essential qualities of a protection relay. (8)  
(ii) Explain the overlapping of protective zones with neat sketch. (8)
17. (a) With a neat diagram discuss the role of instrumentation system in high pressure liquid chromatography. (16)

Or

- (b) (i) Describe the construction details and principle of operation of directional power relay. (8)
- (ii) Derive and explain universal torque equation. (8)
18. (a) Describe the working principle of paramagnetic oxygen analyzer with a neat sketch. Also, mention its applications. (16)
- Or
- (b) Briefly explain the various types of stator fault protection of alternator. (16)
19. (a) Describe the working principle of pH measurement with neat diagram and briefly discuss the need of using a primary reference electrode. (16)
- Or
- (b) List and explain the different protective scheme applied for bus bar protection. (16)
20. (a) Describe the working principle of different mass spectrometers with neat diagrams. (16)
- Or
- (b) Describe the construction, operating principle and application of vacuum circuit breaker. For what voltage range it is recommended? (16)
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