(Pages : 3) **F – 2604**

Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2018
Career Related FDP Under CBCSS
Group 2(a) – PHYSICS AND COMPUTER APPLICATIONS
Vocational Course
PC 1571
Database Management Systems
(2014 Admission Onwards)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** the questions. **(10×1=10 Marks)**

1. What is domain ?
2. Define database.
3. Which command is used to delete the record but retain the structure ?
4. Define attributes.
5. Which symbol represents for derived attributes ?
6. Mention any one relational algebra basic operation.
7. What do you mean by inconsistency ?
8. What is 3rd normal form ?
9. Define null values.
10. List out the mapping cardinality.

SECTION – B

Answer **any eight** questions. **(8×2=16 Marks)**

11. Define DBMS.
12. Identify the purpose of DDL and DML.
13. Compare truncate and delete in SQL command.

P.T.O.

14. List out the database system applications.
15. What is Normalization ?
16. Describe the database schema.
17. Define one to one, one to many mapping cardinalities.
18. What do you mean by Tuple variables ?
19. What is Referential Integrity ?
20. Define the Timestamp domain with example.
21. What are the two types of constraints ?
22. List out the basic structure of SQL expression.

SECTION – C

Answer **any six** questions. **(6×4=24 Marks)**

23. Discuss about the database schema.
24. Explain about the Entity relationship model.
25. Explain the following SQL command with example.
    i) Drop
    ii) Truncate.
26. How are tables created ?
27. What is a minimal set of functional dependencies ?
28. List the differences between lossless and lossy decomposition.
29. Discuss the following.
    i) Entity set
    ii) Attributes
    iii) Relationship set.
30. Compare week and strong entity set.
31. Explain the following :
    i) Entity unique integrity constraints
    ii) Primary key integrity constraints.

SECTION – D

Answer **any two** questions. **(2×15=30 Marks)**

32. Describe the architecture of DBMS.

33. Discuss the following SQL statements using queries with example.
    i) Selection
    ii) Projection
    iii) Join.

34. What is normal form ? Explain about any two normal forms.

35. Discuss on "Security and its different levels".

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2018

Career Related First Degree Programme under CBCSS

Group 2(a) : PHYSICS AND COMPUTER APPLICATIONS

PC 1541 – Electronics

(2014 Admission Onwards)

Time : 3 Hours Max. Marks : 80

SECTION – A

Very short answer type questions (Answer **all 10** questions of **1** mark **each**).

1. Define PIV for a diode.
2. Define dynamic resistance of a diode.
3. Define α for a transistor.
4. What is a class-A amplifier ?
5. What is Barkhausen criterion for oscillation ?
6. What is frequency modulation ?
7. Define modulation factor.
8. What is an ideal OP-Amp ?
9. What is a Half Adder ?
10. Define the terms 'bit' and 'nibble'.

(10×1=10 Marks)

P.T.O.

SECTION – B

Short answer type questions (Answer **any eight** questions) **Each** question carries **2** marks.

11. Give the expression for efficiency of a half wave rectifier.

12. Draw the equivalent circuit of a rectifier diode.

13. Obtain the relation between α and β for a transistor.

14. What is meant by transistor biasing ?

15. Write a note on frequency distortion in amplifiers.

16. What are the advantages of RC coupling in multistage amplifiers ?

17. Derive an expression for the gain of negative voltage feedback amplifier.

18. Explain the operation of a tank circuit.

19. Compare FM with AM.

20. Derive the expression for gain of an inverting amplifier.

21. State De-Morgan's theorem.

22. Describe the OR function using a 2-input OR gate. **(8×2=16 Marks)**

SECTION – C

Answer **any six** questions. **Each** question carries **4** marks.

23. Explain the working of a C-L-C filter circuit.

24. What is meant by stabilisation of operating point ?

25. Compare the different transistor configurations.

26. Explain the working of a two stage RC coupled amplifier.

27. What are the advantages of negative feedback in amplifiers ?

28. Design an RC phase shift oscillator with an output frequency of 1 KHz.

29. A carrier wave of 1000 watts is subjected to 100% amplitude modulation.
    i) Determine the power in side bands.
    ii) Power of modulated wave.

30. Design and sketch an OP-Amp circuit to have a gain of – 8.

31. With a truth table explain J-K flip-flop. **(6×4=24 Marks)**

SECTION – D

Answer **any two** questions. **Each** question carries **15** marks.

32. Draw and explain the VI characteristics of a zener diode. Explain how it maintains a constant voltage across the load.

33. Explain the principle of operation of a Class-A push-pull amplifier. What is cross over distortion ? How can it be eliminated ?

34. Draw and explain a summing amplifier using OP-Amp. Derive the expression for output voltage.

35. Realise a full adder circuit using two half adders and an OR gate.

(2×15=30 Marks)

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Reg. No. : .....

Name : .....

Fifth Semester B.Sc. Degree Examination, December 2018
Career Related First Degree Programme under CBCSS
Group 2 (a) : PHYSICS AND COMPUTER APPLICATIONS
PC 1542 : Atomic and Nuclear Physics
(2013 Admission Onwards)

Time : 3 Hours Max. Marks : 80

SECTION – A

Very short answer type questions. (Answer **all 10** questions of **1** mark **each**).

1. What you mean by spin-orbit coupling ? Give its significance.
2. Distinguish between singlet and triplet state.
3. What is normal Zeeman effect ?
4. Write down the fundamental interactions in nature and their exchange particles.
5. Explain the significance of Stern-Gerlach experiment.
6. Explain quarks and gluons.
7. What do you mean by radioactive decay ?
8. State Gamow theory of α-decay.
9. Write down semi-empirical mass formula. What is its significance ?
10. What are strange particles ? **(10×1=10 Marks)**

SECTION – B

Short answer type questions (Answer **any eight** questions). **Each** question carries **2** marks.

11. Explain Neutrino theory of β-decay.
12. Why vector atom model is said to be the exact model of atom ? Give its significance.

P.T.O.

13. Describe the important features of molecular spectra.

14. Discuss the advantages of breeder reactor over normal reactor.

15. In Stern-Gerlach experiment a beam of atoms is passed through an in homogeneous magnetic field. What will happen if ions are used instead of atoms ?

16. What you mean by critical mass ? What is the role of moderator in nuclear reactor ?

17. Explain spin-orbit coupling. Write down L-S coupling scheme for addition of angular momentum.

18. What you mean by radioactive dating ? How it can be used to determine the age of fossils ?

19. What do you mean by range of α-particle ? Can you measure it ?

20. Discuss classification of elementary particles.

21. Draw a neat diagram of a nuclear reactor. Write functions of each component.

22. Outline general features of nuclear forces. **(8×2=16 Marks)**

SECTION – C

Answer **any six** questions. **Each** question carries **4** marks.

23. Calculate the vibrational energy levels of an HCl molecule, assuming the force constant to be 516 Nm^{-1}

24. A sample of certain element is placed in a magnetic field of flux density 0.3 weber/m^2. How far apart are the Zeeman components of spectral line of wavelength 4000A° ?

25. If the pion decays from rest to give a muon of 4.05 MeV energy, what is the kinetic energy of the accompanying neutrino ? What is the mass of neutrino in this process ?

26. The half-life of Palladium-100 is 4 days. After 12 days a sample of Pd-100 has been reduced to a mass of 4.00 mg. (a) Determine the starting mass. (b) What is the mass after 8 weeks ?

27. Explain the quark model of elementary particles. What would be the structure of K^+ and Σ^+ in terms of the quark model ?

28. If 200 MeV energy is released in the fission of a single U^{235} nucleus, find the number of fission reactions required per second to produce 1 kilowatt power.

29. Define half life and mean life of a radioactive substance. Derive expressions for them in terms of decay constant.

30. Calculate (a) the de Broglie wavelength of an electron moving with a velocity of 5.0×10^5 ms^{-1} and (b) relative de Broglie wavelength of an atom of hydrogen and atom of oxygen moving with the same velocity ($h = 6.63 \times 10^{-34}$ kg m^2 s^{-1}).

31. Using conservation laws of elementary particles find which of the following reaction is possible.

    a) $\pi^- + p = \wedge^\circ + K^\circ$,

    b) $\wedge^\circ = \pi^+ + \pi^-$,

    c) $e^+ + e^- = \mu^+ + \pi^-$ and

    d) $\pi^- + p = n + \pi^\circ$ **(6×4=24 Marks)**

SECTION – D

Answer **any two** questions. **Each** question carries **15** marks.

32. Explain different models of nuclear structure.

33. What is radioactive decay ? What are important particle emitted during radioactive decay ? Give the theory of successive disintegration of radioactive substances and explain radioactive equilibrium.

34. With sufficient theory discuss the vibrational spectra of diatomic harmonic oscillator.

35. What do you mean by nuclear fission and fusion reactions ? Discuss their applications. **(2×15=30 Marks)**