

(6 pages)

1198/RT1

OCTOBER 2010

**Paper I — RADIOGRAPHIC ANATOMY AND
PHYSIOLOGY**

Time : Three hours

Maximum : 100 marks

SECTION A — (20 × 1 = 20 marks)

Answer ALL questions.

Choose the correct answer :

1. There are _____ type of bones in the human body
(a) six (b) five
(c) four (d) three.
2. Neurons are the basic unit of _____ tissue
(a) nervous (b) elastic
(c) adipose (d) areolar.
3. The ribs are comprised of _____ bones
(a) 26 (b) 22
(c) 24 (d) 28.

4. The pH of gastric juice is about of the order of
(a) 6.35 to 6.85 (b) 0.9 to 1.5
(c) 2.5 to 6.5 (d) Less than 1.
5. The blood circulation is classified into _____ categories
(a) four (b) six
(c) three (d) five.

Fill in the blanks :

6. The pulmonary veins carry _____ blood from _____ to the _____
7. Micturition is the process of passing _____ from the _____ in our body.
8. Chyme is the _____ stomach and it enters into the _____ from _____
9. The three main glucocorticoids are _____, _____ and _____
10. The average human brain weight is around _____ Kg.

Match the following:

- | | |
|------------------------------------|---|
| 11. Anterior surface of liver | (a) Under surface of diaphragm |
| 12. Superior surface of liver | (b) Smooth and curve to fit the diaphragm |
| 13. Posterior surface of liver | (c) Facing the abdominal viscera |
| 14. Right lateral surface of liver | (d) Irregular in outline |
| 15. Inferior surface of liver | (e) right side of the liver. |

Answer in a word/sentence.

16. What are floating ribs?
17. Define menocytes.
18. Write about inspiratory reserve volume of the lungs (IRV).
19. What is a peritoneal coat in the stomach?
20. What is the main function of ADH?

SECTION B — (5 × 6 = 30 marks)

Answer ALL questions.

21. (a) List out the function of tissues.
Or
(b) Write a note on the four arches present in the foot.
22. (a) Write notes on freely movable joints.
Or
(b) Write a note on the blood pressure and its measurement using the meter.
23. (a) List out the functions of respiration.
Or
(b) Write about the physiology of micturition.
24. (a) List out the function of the small intestine.
Or
(b) Explain about the thymus gland and its functions.
25. (a) Describe about the cranial nervous system.
Or
(b) With a diagram explain the parts of the uterus.

SECTION C — (5 × 10 = 50 marks)

Answer ALL questions.

26. (a) With a diagram explain about the three types of muscle.

Or

- (b) Explain the function of pelvic girdle and the difference between male and female pelvis.

27. (a) Write a note on the joints of the lower limb.

Or

- (b) Explain in detail about the blood vessels.

28. (a) Describe briefly the various parts of the respiratory systems.

Or

- (b) Give a detailed account of nephrons.

29. (a) With a diagram explain the parts of the liver, its structure and its functions.

Or

- (b) With a diagram explain in detail about the pancreas (Islets of langerhans).

30. (a) List and explain the bones of face.

Or

- (b) Write an essay about white blood cells.
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(6 pages)

1199/RT2

OCTOBER 2010

Paper II – BASIC OF RADIATION PHYSICS

Time : Three hours

Maximum : 100 marks

SECTION A — (20 × 1 = 20 marks)

Answer ALL questions.

1. Protons and neutrons are collectively known as _____.
2. Like charges _____ each other and unlike charges _____ each other.
3. The magnitude of the induced E.M.F. is _____ to the rate of change of flux linkage.
4. At low temperature the valence band is completely _____ and conduction band is completely _____.
5. The stationary anode of tungsten is a plate of _____ mm thickness.
6. The value of 1Bq is of the order of
(a) 1 dps (b) 10 dps
(c) 1.1 dps (d) 0.1 dps

7. TVL =
(a) 3.3 HVL (b) 0.33 HVL
(c) 33 HVL (d) 0.033 HVL
8. The value of one Joule/Kg is
(a) 10 rad (b) 100 rad
(c) 1000 rad (d) 1 rad
9. A thin plate of aluminium or copper is placed in front of the X-ray tube window to absorb
(a) low energy X-Ray photon
(b) high energy X-ray photon
(c) fast energy X-ray photon
(d) slow energy X-ray photon.
10. Smoking 20 cigarettes per day is an estimate of loss of life by
(a) 8.5 years (b) 9.5 years
(c) 80 years (d) 8.2 years
11. Starter motor in cars (a) 50 mSv
12. One curie (b) 760 mm of U_g

13. Atmospheric pressure (c) relay
14. One Roentgen = (d) 3.7×10^{10} Bq
15. Dose limit of skin (e) 2.58×10^{-4} Coulomb/Kg
of air

Answer in few words.

16. What is a rectifier?
17. What is the use of a fuse in an electrical circuit?
18. List the five main types of stationary grids.
19. What is the advantage of TLD badge?
20. What is an absorbed dose?

SECTION B — ($5 \times 6 = 30$ marks)

Answer ALL questions

21. (a) Describe the electromagnetic spectrum, their wavelength region and their photon energy.

Or

- (b) What is a capacitor and describe a parallel plate capacitor?

22. (a) Describe about the various kinds of transformer losses.

Or

- (b) What are the advantages of a relay over a simple mechanical switch?

23. (a) Describe about any three effects of X-rays.

Or

- (b) Define the units of activity.

24. (a) Explain about the Compton effect.

Or

- (b) Write a note on an absorbed dose.

25. (a) Explain about stationary grid and crossed grid.

Or

- (b) Describe about any five features of X-ray protection for the patients.

SECTION C – (5 × 10 = 50 marks)

Answer ALL questions.

26. (a) Describe about force, work, power, energy, centigrade scale and absolute scale.

Or

- (b) Explain the Fleming's left hand rule and describe the general properties of magnetic lines of force.

27. (a) Describe in detail about the construction and operation of a transformer.

Or

- (b) Explain the action of a diode and state the various types of semi-conductors.

28. (a) Draw the diagram of a mammography X-ray tube and X-ray machine and explain them.

Or

- (b) Give a detailed account of two types of beta decay.

29. (a) Explain in detail about the pair production in Compton effect with a neat diagram.

Or

- (b) Write a note on GM counters and Scintillation counters.

30. (a) What are the various types of grids? Explain the crossed grid with a diagram.

Or

- (b) Draw the layout of X-ray room installation and discuss the requirements.
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