

2017

PHYSIOLOGY

[**Honours**]

PAPER – VI

Full Marks : 90

Time : 4 hours

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

[**NEW SYLLABUS**]

GROUP – A

Answer any two questions taking at least one question from each Subgroup : 15 × 2

Subgroup—A(a)

1. (a) What is hypothalamo-hypophysial portal system? Write its physiological significance.

(b) Explain the peculiarities of fetal circulation and its changes after birth.

(c) Explain why prolactin level rises after pituitary-stalk sectioning.

(d) What is IFG ? (4 + 2) + 5 + 2 + 2

2. (a) Define circadian rhythm.

(b) Discuss how circadian rhythm influences the release of ACTH and melatonin ?

(c) What is "Zeitgeber" ? State with example how it influences the biological clock.

2 + (4 + 4) + (2 + 3)

3. (a) Discuss in brief the changes in human uterus during menstrual cycle.

(b) What is blood-testes barrier ? Discuss the stages of spermatogenesis with suitable diagram.

6 + (2 + 7)

Subgroup—A(b)

4. (a) What is lac operon ?

- (b) Briefly state your idea about the regulation of gene expression.
- (c) Write down the mechanism of transcription of RNA in prokaryotes. 2 + 6 + 7
5. (a) What is cloning ?
- (b) State your idea gene therapy.
- (c) Discuss the application of recombinant DNA technology. 2 + 6 + 7
6. (a) Define statistics of dispersion.
- (b) Arrange the following body heights (cm) in a simple frequency table and compute their SD.
- 170, 165, 180, 167, 176, 162, 162, 180, 170,
165, 165, 170.
- (c) State how you can differentiate between one-tail and two-tail 't' test.
- (d) Write briefly on parametric and non-parametric statistics with examples. 2 + 5 + 2 + 6

GROUP – B

Answer any five questions taking at least two questions from each Subgroup : 8×5

Subgroup--B(a)

7. What is pro-insulin ? Discuss the role of insulin in control of carbohydrate metabolism mentioning the importance of GLUT and insulin receptor in this process. $2+6$
8. Prove that cAMP is the second messenger. Explain the function of Tyrosine Kinase. $5+3$
9. Discuss the role of suprachiasmatic nucleus (SCN) as a major circadian pacemaker. 8
10. Discuss the embryological development process of heart in human. 8
11. Briefly discuss different steps of fertilization. Write the viability time for human sperm and ovum. $6+2$

Subgroup--B(b)

12. (a) What is DNA replication ?

- (b) Elucidate your idea about post transcriptional modification. 2 + 6
13. What is nucleosome ? Write down your idea about the structure of a chromosome. 2 + 6
14. What is Southern blot technique ? Explain the downstream process of fermentation technology ? What do you mean by biofuels ? 2+4+2
15. (a) What is computer virus ? Define 'biochips'.
- (b) State when and why null hypothesis can be rejected.
- (c) What is degree of freedom ? (2 + 2) + 2 + 2
16. (a) What do you mean by computer networking ? Briefly discuss about WAN and LAN.
- (b) Write the full form of BASIC and FORTRAN. What is tool bar ? (1 + 4) + (1+1+1)

GROUP - C

Answer any five questions taking at least two questions from each Subgroup : 4 × 5

Subgroup—C(a)

17. Briefly write down the physiological functions of gastrin. 4
18. Compare the functions of thyrocalcitonin and parathormone in controlling plasma Ca^{2+} level. 4
19. Write how growth hormone exerts its action through JAK-STAT pathway. 4
20. What is jet lag ? Write the circadian basis of jet lag. 2+2
21. Write the functions of human placenta. 4

Subgroup—C(b)

22. What is proteomics ? 4
23. Write a short note on frequency polygon. 4
24. What is power point in computer ? What is Wi-fi ? 2+2

25. What is skewness ? What is standard deviation ?

2+2

26. Write a short notes on :

2+2

(i) Houssay animal

(ii) Pheochromocytoma.
