UG/III/PHY/H/VI/18(New)

2018

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*) Classify hormone receptors explaining the basis of their classification.

(*b*) Explain the G-protein-mediated action of receptor with suitable diagram. 8 + 7

2. (*a*) What is acrosomal reaction ?

(*b*) With suitable diagram highlight the molecular basis of human fertilization. 5 + 10

3. (*a*) Give a brief idea about the role of melatonin in regulation of gonadal rhythms.

(*b*) Discuss the physiology and mechanism of parturition. 8 + (3 + 4)

Subgroup—A(b)

4. (*a*) Explain the experiment of Meselson and Stahl, and justify how it proved the semiconservative mode of DNA replication.

(*b*) Classify chromosome aberrations giving example of each. (5 + 3) + 7

5. (*a*) Why is Southern blot done ? What are the implications of the other two blots ?

(*Continued*)

(*b*) Briefly describe DNA mismatch and recombination repair systems.

$(4 + 3 + 3) + (2\frac{1}{2} + 2\frac{1}{2})$

6. (*a*) When is Chi-square test preferred over Students' *t*-test ?

(*b*) What is the difference in statistical analysis for continuous and discrete variables ? Justify. $5 + (5 + 5)$

GROUP–B

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

Subgroup–B(a)

7. Describe the control of uterine contraction by the interplay of vasopressin and oxytocin. $4 + 4$

8. (*a*) What is ghrelin ? State its function. Name two glycoprotein hormones.

(*b*) Discuss the steps of formation of cAMP from activated G-protein coupled receptor. $(1 + 2 + 1) + 4$

9. **Explain the process of implantation of a fertilized ovum in the uterus with a suitable diagram.** 5 + 3

10. **Explain the neural basis of biological clock with a schematic diagram.** 8

11. **Write notes on following :** 4 + 4

(*i*) IP_3-DAG second messenger system

(*ii*) Hormonal regulation of spermiogenesis.

Subgroup–B(b)

12. (*a*) Name the factors those can damage DNA.

(*b*) Define restriction enzymes. Give two examples. 4 + 4

13. (*a*) What do you mean by GM organisms ? What is the principle behind the generation of transgenic organisms ?

(*b*) How was the production of insulin facilitated by the advent of recombinant DNA technology ? (2 + 2) + 4

14. How would you open a new file in MS-Word ? What is tool box ? 5 + 3

15. Define linear correlation. What are meant by Kurtosis and skewness ? $3 + (2\frac{1}{2} + 2\frac{1}{2})$

16. How is computer virus different from biological virus ? Explain emphasiging on their mode of action. 2 + (3 + 3)

GROUP–C

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

Subgroup–C(a)

17. Describe the mode of action of tyroxine kinase with a diagram. 4

18. Why primordial follicle can't be matured during childhood ? What is leutinization ? 2 + 2

19. How are the physiological functions of VIP and GIP related ? 4

20. **Write briefly on the causes and symptoms of parathyroid tetany.** 2 + 2

21. **What are ovarian cysts ? How is its formation is related with hormonal interplay ?** 2 + 2

Subgroup–C(b)

22. **What are tumor supressor genes ? Can it be utilized in the treatment of cancer ?** 2 + 2

23. Write short notes on (*i*) Biosensor and (*ii*) Bio-chips. 2 + 2

24. How is bioremediation important for a better environment to line in ? Justify. 4

25. Explain the sampling methods used in statistics. 4

26. Give two uses of each : 4

(*a*) MS Excel

(*b*) MS Power Point.