

**2016**

**PHYSIOLOGY**

**[ Honours ]**

**PAPER – III**

*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*

**[ OLD SYLLABUS ]**

**GROUP – A**

**Answer any two questions, taking one  
from each Subgroup :**

**15 × 2**

*( Turn Over )*

Subgroup – A(a)

1. (a) Discuss the role of  $\text{Na}^+$  and  $\text{K}^+$  ions in the different phases of generation of action potential of nerve fibers. What do you mean by positive after potential and negative after potential ?  
  
(b) Write the mechanism of synaptic transmission. (5+4)+6
  
2. (a) What is excitation-contraction coupling ? Mention the series of steps which cause sliding of the thin filament over the thick filament during muscle contraction.  
  
(b) What is end-plate potential ? What is triad ? (3 + 8) + (2 + 2)
  
3. (a) Classify pupillary reflexes. What is near response ?  
  
(b) "Visual excitation of rod is triggered by photoisomerization of 11-cis-retinal" explain. State the role of cyclic GMP cascade. (2+2)+(8+3)

**Subgroup – A(b)**

4. (a) What is muscle tone ? State the role of structural peculiarities of muscle spindle and functions of gamma efferent fibres in regulation of muscle tone.
- (b) Classify acetylcholine receptors. What is alpha block in EEG ? (2+8)+(3+2)
5. (a) What is insensible perspiration ? Describe the histological structure of skin with a suitable diagram.
- (b) Write the composition of sweat. State how its secretion is regulated. (2+6)+(2+5)
6. (a) What is J-G apparatus ? Mention its components and functions.
- (b) What is GFR ? Write about the factors controlling GFR. (2+3+3)+(2+5)

**GROUP – B**

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

Subgroup – B(a)

7. Discuss in brief the following properties of nerve fibre : 2+2+2+2
- (i) all or none law,
  - (ii) Refractory period
  - (iii) Conductivity
  - (iv) Adaptation.
8. Write the structure of 'organ of corti' and state its role in the mechanism of hearing. 3+5
9. What are orthodromic and antidromic nerve impulse transmission? State the factors controlling velocity of nerve impulse conduction. 2+6
10. What is referred pain? Discuss on gate control theory and endogenous pain inhibition mechanism in relation to pain. 2+3+3
11. Briefly discuss on the modern concept of colour vision. 8

Subgroup – B(b)

12. What is global aphasia ? Discuss the role of Wernicke's area and Broca's area in the process of speech processing. 2 + 6
13. Discuss the mechanism of formation of CSF. How it is circulated ? 5 + 3
14. What is righting reflex ? Discuss the role of stereocilia and Kinocilium for the maintenance of equilibrium of the body. 2 + 6
15. What is hypothalamic thermostat ? State the composition and functions of sebum. 2 + 3 + 3
16. Discuss briefly the mechanism of formation of urine from glomerular filtrate. 8

GROUP – C

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

Subgroup – C(a)

17. Distinguish between red and white striated muscle fibres. 4

18. Write a short note on sarcotubular system. 4
19. Write about the histology of taste bud. 4
20. What is CFF ? State its importance. 2+2
21. Define chronaxie and rheobase. 2+2

Subgroup – C(b)

22. What is intention tremor ? What is tremor at rest ? 2+2
23. State what is classical conditioning ? 4
24. Write the organisation and classification of sweat glands. 2+2
25. What is inulin clearance test ? What is its significance ? 3+1
26. Distinguish between cortical and juxta-medullary nephrons. 4
-