

Total Pages- 6

PG/I/HPHYS/f/07

2007

HUMAN PHYSIOLOGY

PAPER-III

Full Marks : 100

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

**Write answers to Questions of each Unit
in separate books**

UNIT-5

Answer Q.No. 1 and any *two* from the rest

1. Answer any four of the following:

2 1x4
2

(a) What is piezoelectric effect?

(b) How the biphasic action potential can be recorded ?

(Turn Over)

- (c) Why is the **esophageal** lead used for ECG recording ?
- (d) **How is cell membrane capacitance related to resting membrane potential ?**
- (e) **Why artificial pacemaker is used ?**
- (f) **What are different types of microelectrodes?**
2. (a) **Discuss the electrophysiological basis of dark and light current in photoreceptor cells.**
- (b) **Discuss the mechanism of phototransduction in rod cells of the retina.**
- (c) **What is ERG ?** **6+10+4**
3. (a) **Describe briefly the characteristics of different components of EEG in sleep.**
- (b) **Discuss the characteristics changes of EEG in different stages of sleep.**
- (c) **Discuss the EEG manifestation during grand mal epilepsy.**
- (d) **Discuss electrocardiographic changes during myocardial infarction.** **5+8+3+4**

4. (a) **What do you mean by laminar flow and turbulent flow? Mention the reason for conversion of a laminar flow to a turbulent flow. Discuss the role of viscosity in the maintenance of laminar flow.**
- (b) **What is airway resistance ? Give a suitable method for its measurement.**
- (c) **What do you mean by acoustic impedance ? State the basic principle of ultrasound therapy.**
- 10+4+6
5. (a) **Mention different techniques used for the measurement of blood flow. Discuss the electromagnetic blood flow measuring technique using alternating current.**
- (b) **Discuss briefly the electrophysiological mechanism for the development of EMG. Discuss the changes of EMG on a comparative basis during static and dynamic muscular work.**
- (2+8)+(5+5)

UNIT-6

Answer **Q.No. 1** and any two from the rest.

1. Answer any *two* of the following: 5 x 2
- (a) How would you differentiate group-I b fibres from group-I a fibres on the basis of functional characteristics ?

- (b) **Describe the response characteristics of semicircular afferent fibres to constant and sinusoidal angular accelerations and decelerations.**
- (c) Describe the molecular structure of stereoscilium and kinocilium.
- (d) **Describe the role of different proteins in the regulation of axoplasmic flow.**
2. (a) **Describe the cerebellar cortical neural circuitry and discuss the mode of operation of this circuitry.**
- (b) **Justify the names of spinocerebellum and vestibulocerebellum for particular regions of cerebellum.**
- (c) **What do you mean by extra-motor predictive functions of cerebellum ?**
- (d) **Discuss the role of cerebellum as a "damping and clamping" system.** (6 + 4) + 4 + 3 + 3
3. (a) **Mention the differences between type-I and type-II synapse.**

- (b) What **is meant** by quantal release of neurotransmitter ?
- (c) What is synapsin-I ? Discuss the molecular basis of docking and priming of synaptic vesicles.
- (d) What do you mean by "fuzzy" coated vesicles?
 $5+3+(2+8)+2$
4. (a) Describe the neuropathological changes in Parkinson's disease. How does MPTP produce experimental Parkinson's disease ?
- (b) Describe **the neural circuits** of basal **ganglia**.
- (c) **Discuss the role of different neurotransmitter in slow wave sleep and REM sleep** . $(3 + 3) + 8 + 6$
5. (a) Discuss in brief the current concept of mechanism of stimulation of receptor cells in visual system.
- (b) What is the mode of action of the bipolar cells in the retinal circuitry during transmission of visual signal ?

(c) What are meant by primary and secondary visual area? State their role in visual perception.

(d) What is generalized interpretative area of brain ?

$$6+5+(3+4)+2$$