

CITY COLLEGE EXAMINATION CENTRE

B.Sc. (Hons.) Part – III Practical Examination, 2020

[According to Calcutta University Botany Hons. (1+1+1) syllabus]

Subject: BOTANY
Paper – VII

Full Marks: 100

Time: 2 hours

- A. Class Attendance:** 10
- B. Class performance/internal assessment:** 10
- C. Laboratory Notebook:** 20
- D. Answer all the questions:** 30 x 2 = 60
- (1) If you are given one mesophytic and one xerophytic leaf, then in which type of leaf the rate of transpiration will be low under same experimental conditions and why? 2
- (2) Calculate the amount of Sucrose required to prepare 250 mL of 1 (M) Sucrose solution [Mol. Wt. of Sucrose is 342.3]. 2
- (3) Prepare a requisition slip to determine the stomatal frequency of a mesophytic leaf. 2
- (4) Define Respiratory Quotient (RQ). 2
- (5) Prepare a requisition slip to measure the osmotic pressure of storage tissue by weighing method. 2
- (6) To determine the rate of photosynthesis for an aquatic plant, if you gradually increase HCO_3^- concentration in water (keeping all other factors constant) what will be the effect on photosynthetic rate and why? 2
- (7) Under same experimental conditions, if you keep a mesophytic leaf to determine its transpiration rate and an uncovered petridish with some amount of water to find out the rate of evaporation, in which case the rate will be higher and why? 2
- (8) Under experimental condition, if you find that 50% *Rhoeo* leaf cells are plasmolysed when placed in 0.25 (M) sucrose solution, then what will be the osmotic potential value of leaf tissue? 2
- (9) (i) “Transpiration is a physical phenomenon whereas evaporation is a physiological process” – True or False? 1
- (ii) “To determine the percentage (%) of imbibitions for proteinaceous seeds, we need some pea seeds without seed coat” – True or False? 1

- (10) If you have 100 mL of 60% Sucrose solution and you are asked to prepare 50 mL of 30% Sucrose solution then how much of stock solution you will use? 2
- (11) Write down the experiment and observation of AgNO_3 test for qualitative detection of Tartaric acid. 2
- (12) By which test we can differentiate between Glucose and Fructose? Why Fehling's test gives positive response after Sucrose is hydrolysed? 1+1 = 2
- (13) Write down the experiments and observations for detection of Fe (iron) from plant ash sample. 2

Or

- Write down the experiments and observations for detection of S (sulphur) and Ca (calcium) from plant ash sample. 1+1 = 2
- (14) (i) "Biuret test, Ninhydrin test, Barfoed's test and Millon's test – all are used for detection of protein". True or False? 1
- (ii) Describe Xanthoproteic test for detection of protein (experiment and observation). 1
- (15) Prepare a requisition slip for estimation of titrable acidity from lemon. 2
- (16) Why Glycine cannot be titrated directly? What is the reason for addition of Formalin to the reaction mixture? 1+1 = 2
- (17) What is Normality? Calculate the amount of NaOH required to prepare 300 mL of (N/10) NaOH solution [Mol. Wt. of NaOH is 40]. 1+1 = 2
- (18) Can we use (N/10) NaOH in place of (N/50) HCl for quantification of Urease enzyme activity by titration? Justify your answer. 1+1 = 2
- (19) Why is a 'Blank set' prepared during the estimation of Catalase activity? 2
- (20) Prepare a requisition slip for estimation of Glucose by Benedict's quantitative reagent (BQR). 2
- (21) What is the full name and chemical nature of BSA? At which nanometre (nm), the optical density (OD) of BSA reaction mixture should be measured in a colorimeter? 1+1 = 2
- (22) Why the staining methods you followed are called 'gradational dehydration' and 'differential staining'? 2
- (23) How do you distinguish Monocot stem from Dicot stem under microscope? 2
- (24) Draw and label a 'Diacytic' and a 'Paracytic' stomata. 1+1 = 2
- (25) What is 'medullary bundle'? Where is it found? 1+1 = 2
- (26) What type of activities of the secondary cambium causes: 1+1 = 2
- (i) 'Ridged and furrowed xylem cylinder' in *Bignonia*?
- (ii) "Intraxylary phloem' in *Tecoma*?

(27) Write histochemical tests mentioning observations with longitudinal sections of rhizome drug of *Zingiber* showing the presence of starch in the vessels and the vessels are non-lignified. 2

(28) Represent with labelled diagrams only (with blue/black ball pen) two microscopic features that help to identify the powder drug of *Holarrhena* bark with that of *Zingiber* rhizome. 1+1 = 2

(29) Write two chemical tests (experiments and observations) of tannin with extract sample of *Terminalia* fruit pericarp. 2

(30) Write in brief the procedure for preparation of extract sample from dried leaf drug of *Catharanthus* and write one confirmatory chemical test with observation for presence of alkaloid in the extract sample. 1+1 = 2