



Previous Year Solved Question Paper  
of

**G.A.T.E. (XL) 2019**

**Life Sciences**

**FOOD TECHNOLOGY**

**Examination**

*(Original Question Paper with Answer Key)*

**GRADUATE APTITUDE TEST IN ENGINEERING**



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**Q. 1 – Q. 10 carry one mark each & Q. 11 – Q. 20 carry two marks each.**

Q.1 Colloidal stability of milk casein is because of the highly hydrated carbohydrate residues in \_\_\_\_\_.

- (A)  $\alpha_{s1}$  casein      (B)  $\alpha_{s2}$  casein      (C)  $\beta$  casein      (D)  $\kappa$  casein

**Ans. D**

Q.2 Rice bran is stabilized prior to oil extraction to protect it from the activity of \_\_\_\_\_.

- (A) Polyphenol oxidase      (B) Peroxidase  
(C) Lipase      (D) Lipoxygenase

**Ans. C**

Q.3 Sticking of powder to wall of the chamber during spray drying of fruit juice is due to \_\_\_\_\_.

- (A) Low glass transition temperature of the compounds in juice  
(B) High glass transition temperature of the compounds in juice  
(C) Improper processing parameters of spray dryer  
(D) Presence of gums in feed material

**Ans. A**

Q.4 Thearubigins and theaflavins in black tea are formed by the oxidation and dimerization of \_\_\_\_\_.

- (A) Quercetin      (B) Catechins      (C) Gallic acid      (D) Kaempferol

**Ans. B**

Q.5 Ratio of Schmidt number to Lewis number is \_\_\_\_\_.

- (A) Prandtl number      (B) Reynolds number  
(C) Nusselt number      (D) Sherwood number

**Ans. A**

Q.6 'Red dog' is one of the byproducts during milling of \_\_\_\_\_.

- (A) Corn      (B) Rice      (C) Ragi      (D) Wheat

**Ans. D**

- Q.7 a) **Assertion:** Ash content is one of the quality indicators of the flour to be used for bread making.  
 r) **Reason:** Higher ash content indicates better quality of the bread flour.

Choose the correct answer from the following:

- (A) Both a) and r) are true and r) is the correct reason for a)  
 (B) Both a) and r) are true but r) is not the correct reason for a)  
 (C) Both a) and r) are false  
 (D) a) is true but r) is false

**Ans. D**

- Q.8 An ice cream mix of 870 g L<sup>-1</sup> has been used to prepare ice cream which yielded a finished product of 490 g L<sup>-1</sup>. The per cent over run is \_\_\_\_\_ (round off to 1 decimal place).

**Ans. 77.4 TO 77.6**

- Q.9 Impeller in a fruit juice mixing tank is rotating at 200 rpm with a Reynolds number >10<sup>4</sup>. Density of juice is 1045 kg m<sup>-3</sup>. If diameter of the impeller is doubled and other conditions remained constant, the power requirement of mixing will increase by a factor of \_\_\_\_\_.

**Ans. 32 TO 32**

- Q.10 Paddy consisting of 20% husk has been milled to remove 6% bran during polishing. Assuming no other losses, yield (per cent) of polished rice from the paddy is \_\_\_\_\_ (round off to 1 decimal place).

**Ans. 74.8 TO 75.6**

- Q.11 Match the following laws in Column I with corresponding phenomenon in Column II.

| <b>Column I</b> |                              | <b>Column II</b> |                                 |
|-----------------|------------------------------|------------------|---------------------------------|
| P               | Newton's law                 | 1                | Size reduction                  |
| Q               | Hertz constant stress theory | 2                | Substance cooling               |
| R               | Fick's law                   | 3                | Damage of fruits and vegetables |
| S               | Bond's law                   | 4                | Molecular diffusion             |

- (A) P-2, Q-3, R-4, S-1  
 (B) P-3, Q-2, R-4, S-1  
 (C) P-3, Q-1, R-4, S-2  
 (D) P-4, Q-3, R-2, S-1

**Ans.A**

- Q.12 Match the mold in Column I with its asexual/sexual spore shown in Column II.

| <b>Column I</b> |                    | <b>Column II</b> |                 |
|-----------------|--------------------|------------------|-----------------|
| P               | <i>Aspergillus</i> | 1                | Arthrospore     |
| Q               | <i>Geotrichum</i>  | 2                | Oospores        |
| R               | <i>Rhizopus</i>    | 3                | Conidia         |
| S               | <i>Oomycetes</i>   | 4                | Sporangiospores |

- (A) P-3, Q-1, R-4, S-2  
 (B) P-1, Q-4, R-3, S-2  
 (C) P-4, Q-3, R-1, S-2  
 (D) P-4, Q-1, R-2, S-3

**Ans. A**

Q.13 Match the foods given in Column I with their specific usage given in Column II.

| Column I |                       | Column II |               |
|----------|-----------------------|-----------|---------------|
| P        | Egg yolk              | 1         | Ice cream     |
| Q        | Pregelatinised starch | 2         | Mayonnaise    |
| R        | Gum                   | 3         | Baking powder |
| S        | Starch                | 4         | Baby food     |

(A) P-2, Q-4, R-1, S-3

(B) P-4, Q-1, R-2, S-3

(C) P-2, Q-3, R-1, S-4

(D) P-1, Q-4, R-1, S-3

Ans. 13

Q.14 Match the bioactive compounds in Column I with their botanical source given in Column II.

| Column I |                  | Column II |                            |
|----------|------------------|-----------|----------------------------|
| P        | Isoflavones      | 1         | Corn                       |
| Q        | Resistant starch | 2         | Grapes                     |
| R        | Xanthophyll      | 3         | Soybean                    |
| S        | Resveratrol      | 4         | Plantain (culinary banana) |

(A) P-2, Q-4, R-1, S-3

(B) P-3, Q-4, R-1, S-2

(C) P-4, Q-1, R-2, S-3

(D) P-4, Q-3, R-2, S-1

Ans. B

Q.15 Match the following microbial species in Column I with related disease caused by them as shown in Column II.

| Column I |                         | Column II |                     |
|----------|-------------------------|-----------|---------------------|
| P        | <i>Vibrio sp.</i>       | 1         | Gastroenteritis     |
| Q        | <i>Shigella sp.</i>     | 2         | Typhoid             |
| R        | <i>E. coli</i>          | 3         | Cholera             |
| S        | <i>Salmonella typhi</i> | 4         | Bacillary dysentery |

(A) P-1, Q-3, R-4, S-2

(B) P-2, Q-3, R-4, S-1

(C) P-3, Q-1, R-4, S-2

(D) P-3, Q-4, R-1, S-2

Ans. D

Q.16 Buffalo milk having density of  $1030 \text{ kg m}^{-3}$  is homogenized with a pressure of 30 MPa. Given, acceleration due to gravity as  $9.81 \text{ m s}^{-2}$  and assuming no pressure loss, the velocity ( $\text{m s}^{-1}$ ) of the milk flowing through the homogenizer valve will be \_\_\_\_\_ (round off to 2 decimal places).

Ans. 240 TO 242

Q.17 Potato slices have been dehydrated from an initial solid content of 12% to a final solid content of 94%. If the peeling and other losses are to the tune of 10%, final yield (per cent) of the dried chips per ton of fresh potato taken is \_\_\_\_\_ (round off to 2 decimal places).

Ans. 11.45 TO 11.55

Q.18 A mixed fruit beverage with 12 °Brix having specific heat of  $4298 \text{ J kg}^{-1} \text{ K}^{-1}$  is being heated from  $30 \text{ }^\circ\text{C}$  to  $95 \text{ }^\circ\text{C}$  for pasteurization at a flow rate of  $1000 \text{ L h}^{-1}$  in a tubular heat exchanger. Steam at  $100 \text{ }^\circ\text{C}$  is used as heating medium which is converted into condensate at  $100 \text{ }^\circ\text{C}$ . If the density of beverage is  $1075 \text{ kg m}^{-3}$  and the latent heat of steam at the given temperature is  $2257 \text{ kJ kg}^{-1}$ , the mass flow rate of steam ( $\text{kg min}^{-1}$ ) is \_\_\_\_\_ (*round off to 2 decimal places*).

*Ans. 2.16 TO 2.25*

Q.19 Room air is at  $40 \text{ }^\circ\text{C}$  with 60% relative humidity. Saturated vapour pressure of water at  $40 \text{ }^\circ\text{C}$  is  $7.375 \text{ kPa}$ . Humid volume of air ( $\text{m}^3$  per kg of dry air) is \_\_\_\_\_ (*round off to 3 decimal places*).

*Ans. 0.924 TO 0.930*

Q.20 Freezing of  $100 \text{ mm}$  spherical meat ball with 60% moisture at  $35 \text{ }^\circ\text{C}$  is being done in an air blast freezer maintained at  $-45 \text{ }^\circ\text{C}$ . Given, latent heat of fusion for water is  $333.2 \text{ kJ kg}^{-1}$ , thermal conductivity of meat is  $1.5 \text{ W m}^{-1} \text{ }^\circ\text{C}^{-1}$ , convective heat transfer coefficient is  $40 \text{ W m}^{-2} \text{ }^\circ\text{C}^{-1}$ , density of frozen meat is  $980 \text{ kg m}^{-3}$  and initial freezing temperature of meat ball is  $-10 \text{ }^\circ\text{C}$ . Using Plank's equation, freezing time (h) is \_\_\_\_\_ (*round off to 2 decimal places*).

*Ans. 1.06*

**END OF THE QUESTION PAPER**

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